

FIGURE 2

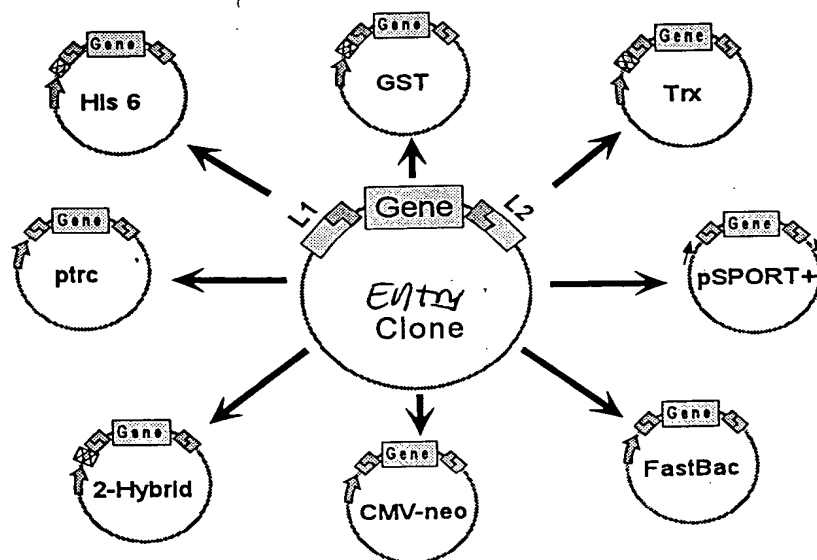


FIGURE 3

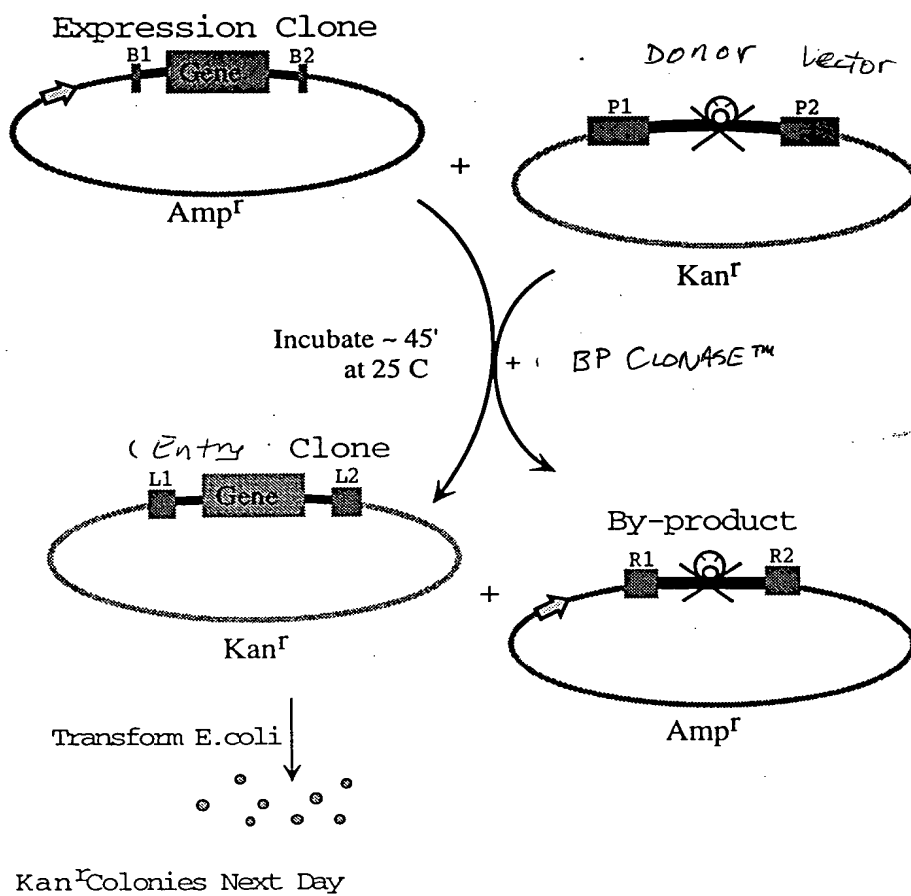


FIGURE 4

A

B

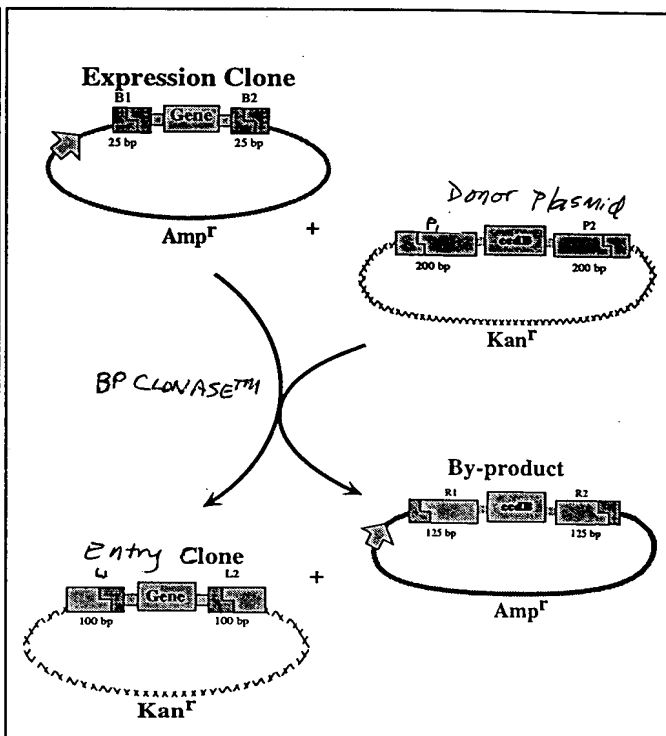
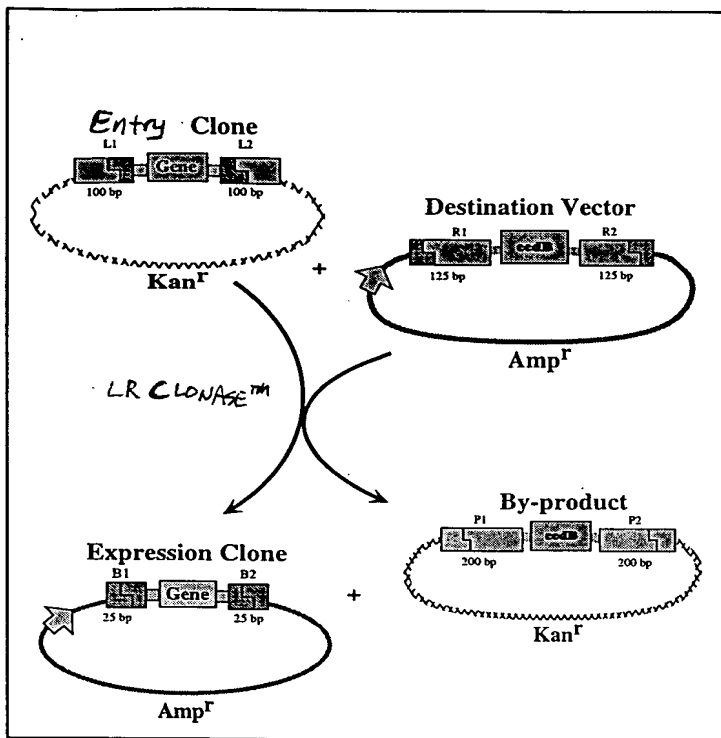


FIGURE 5

The diagram illustrates the integration of a gene into a plasmid vector using Cre recombinase. It shows two recombination events, one at the attB1/attL1 site and another at the attB2/attL2 site.

attB1 Site: A horizontal line represents the DNA sequence. Above the line, a double-headed arrow labeled "attB1" spans the sequence. The sequence is divided into two parts by a vertical line. The left part is labeled "From attR1" and contains the sequence: T S L Y K K A G. The right part is labeled "From attL1" and contains the sequence: T T T C G T C C G A N N. The sequence is flanked by two sets of three nucleotides (NNN) on each side, representing the "From Destination Vector" and "From Entry Clone" regions.

attB2 Site: A horizontal line represents the DNA sequence. Above the line, a double-headed arrow labeled "attB2" spans the sequence. The sequence is divided into two parts by a vertical line. The left part is labeled "From attL2" and contains the sequence: P A F L Y K V V. The right part is labeled "From attR2" and contains the sequence: T T T C A C C A N N. The sequence is flanked by two sets of three nucleotides (NNN) on each side, representing the "From Entry Clone" and "From Destination Vector" regions.

Figure 6

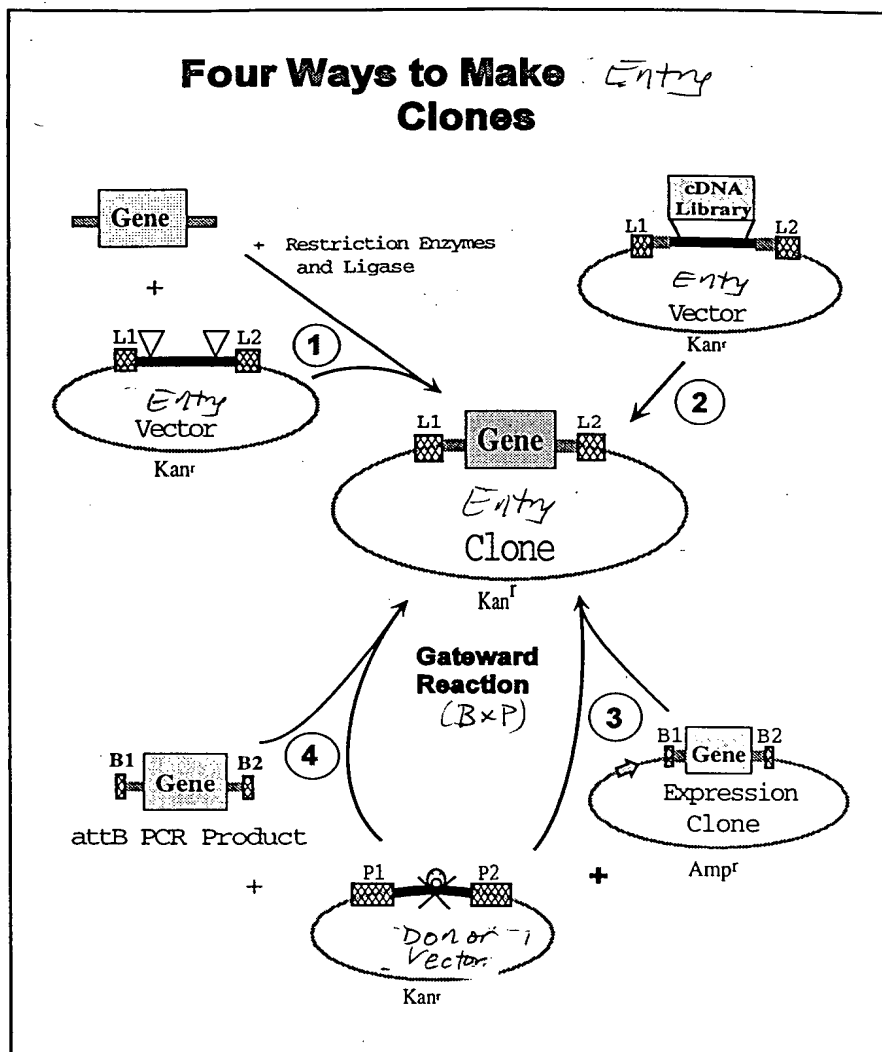


FIGURE 7

CC-000000000000

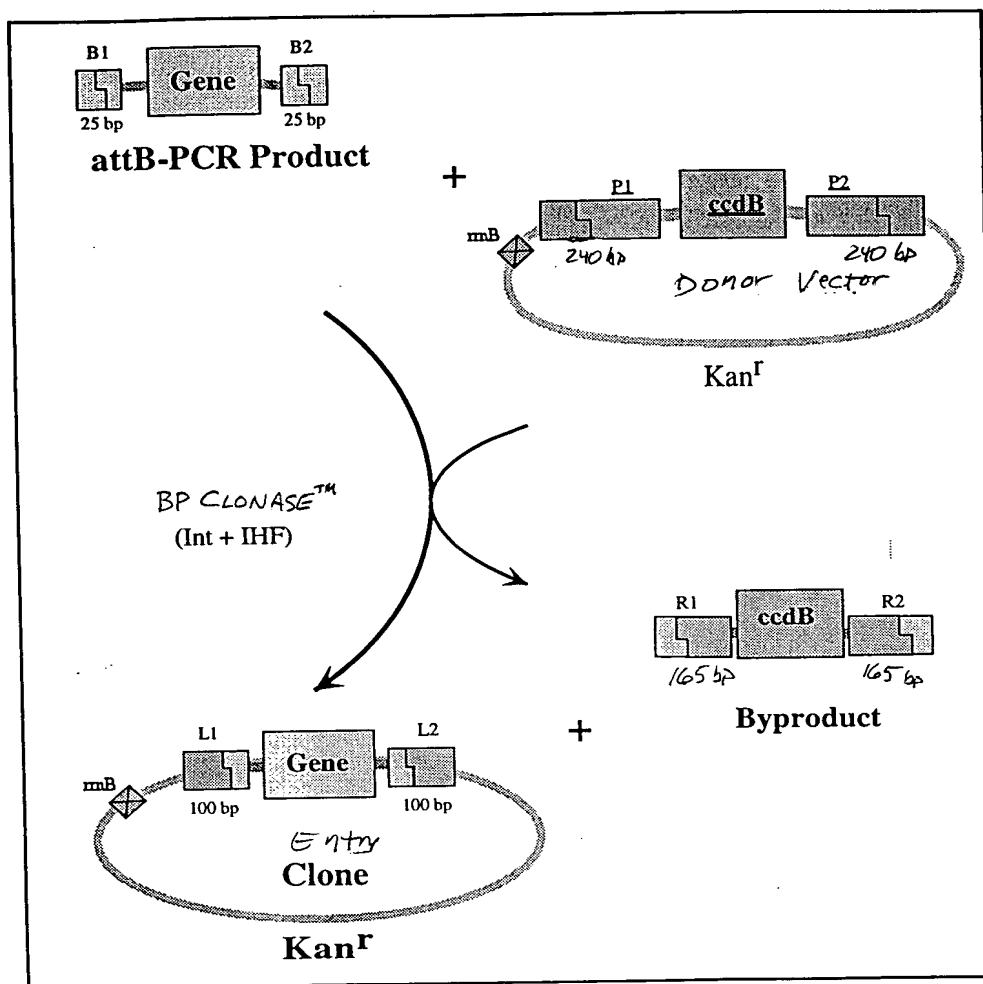


FIGURE 8

Recombination Site Nucleotide Sequences

attB1: 5'-ACAAGTTTGTACAAAAAAGCAGGCT-3'

attB2: 5'-ACCCAGCTTTCTTGTACAAAGTGGT-3'

attP1: 5'-TACAGGTCACATAATACCATCTAAGTAGTTGATTCATAGTGACTGGATATG-TTGTGTTTTACAGTATTATGTAGTCTGTTTTTTATGCAAAATCTAATTTA-ATATATTGATATTTATATCATTTTACGTTTCTCGTTCAGCTTTTTTTGTAC-AAAGTTGGCATTATAAAAAAGCATTGCTCATCAATTTGTTGCAACGAACA-GGTCACATCAGTCAAATAAAAATCATTATTTG-3'

attP2: 5'-CAAATAATGATTTTATTTTGACTGATAGTGACCTGTTCGTTGCAACAAAT-TGATAAGCAATGCTTTCTTATAATGCCAACTTTGTACAAGAAAGCTGAAC-GAGAAACGTAAAATGATATAAATATCAATATATTAAATTAGATTTTGCAT-AAAAAACAGACTACATAATACTGTAAAACACAACATATCCAGTCACTATGA-ATCAACTACTTAGATGGTATTAGTGACCTGTA-3'

attR1: 5'-ACAAGTTTGTACAAAAAAGCTGAACGAGAAACGTAAAATGATATAAA-TATCAATATATTAAATTAGATTTTGCATAAAAAACAGACTACATAATAC-TGTA AACACAACATATCCAGTCACTATG-3'

attR2: 5'-GCAGGTCGACCATAGTGACTGGATATGTTGTGTTTTACAGTATTAT-GTAGTCTGTTTTTTATGCAAAATCTAATTTAATATATTGATATTT-ATATCATTTTACGTTTCTCGTTCAGCTTTCTTGTACAAAGTGGT-3'

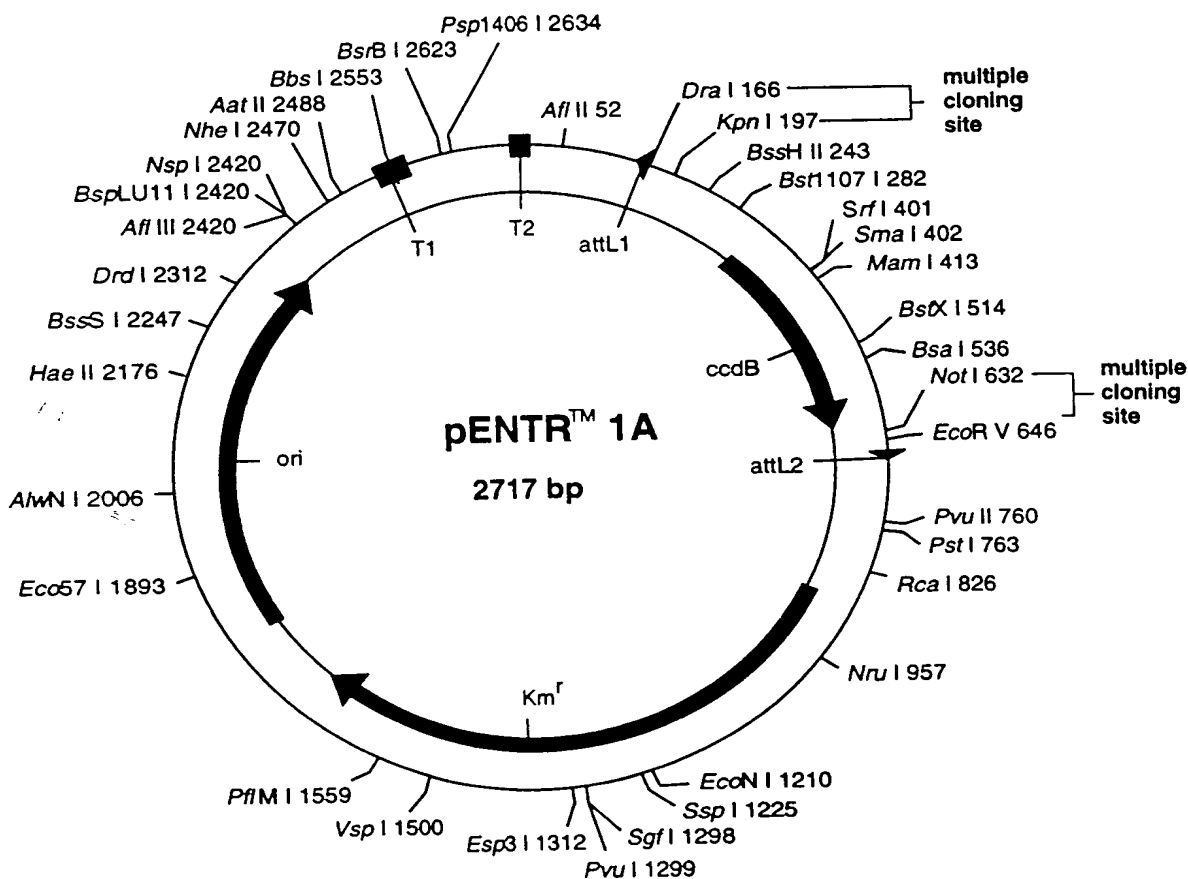
attL1: 5'-CAAATAATGATTTTATTTTGACTGATAGTGACCTGTTCGTTGCAAC-AAATTGATAAGCAATGCTTTTTTATAATGCCAACTTTGTACAAAAAA-GCAGGCT-3'

attL2: 5'-CAAATAATGATTTTATTTTGACTGATAGTGACCTGTTCGTTGCAACAA-ATTGATAAGCAATGCTTTCTTATAATGCCAACTTTGTACAAGAAAGCTGGGT-3'

Figure 9

THE JOURNAL OF THE

--- ccdB gene --- G AAT TCG CGG CCG CAC TCG AGA TAT CTA GAC CCA GCT TTC TTG TAC AAA
 C TTA AGC GCC GGC GTG AGC TCT ATA GAT CTG GGT CGA AAG AAC ATG TTT



pENTR1A 2717 bp

Base Nos.	Gene Encoded
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321..626	ccdB
655..754	attL2
877..1686	KmR
1791..2364	ori

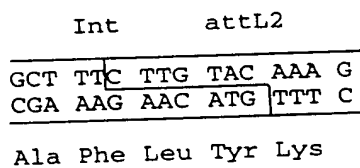
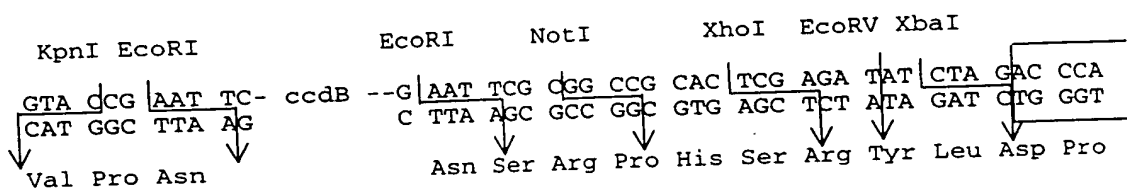
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61 GGGCCCCAAA TAATGATTTT ATTTTGACTG ATAGTGACCT GTTCGTTGCA ACAAATTGAT
121 AAGCAATGCT TTTTATAAAT GCCAACTTTG TACAAAAAAG CAGGCTTTAA AGGAACCAAT
181 TCAGTCGACT GGATCCGGTA CCGAATTCGC TTAATAAAAG CCAGATAACA GTATGCGTAT
241 TTGCGCGCTG ATTTTTCGCG TATAAGAATA TATACTGATA TGTATACCCG AAGTATGTCA
301 AAAAGAGGTG TGCTTCTAGA ATGCAGTTTA AGGTTTACAC CTATAAAAGA GAGAGCCGTT
361 ATCGTCTGTT TGTGGATGTA CAGAGTGATA TTATTGACAC GCGCGGGCGA CGGATAGTGA
421 TCCCCCTGGC CAGTGCACGT CTGCTGTCAG ATAAAGTCTC CCGTGAACCT TACCCGGTGG
481 TGCATATCGG GGATGAAAGC TGGCGCATGA TGACCACCGA TATGGCCAGT GTGCCGGTCT
541 CCGTTATCGG GGAAGAAGTG GCTGATCTCA GCCACCGCGA AAATGACATC AAAAACGCCA
601 TTAACCTGAT GTTCTGGGGA ATATAGAATT CGCGGCCGCA CTCGAGATAT CTAGACCCAG
661 CTTTCTTGTA CAAAGTTGGC ATTATAAGAA AGCATTGCTT ATCAATTTGT TGCAACGAAC
721 AGGTCACTAT CAGTCAAAAT AAAATCATT TTTGCCATCC AGCTGCAGCT CTGGCCCGTG
781 TCTCAAAATC TCTGATGTTA CATTGCACAA GATAAAAATA TATCATCATG AACAAATAAA
841 CTGTCTGCTT ACATAAACAG TAATAACAAG GGTGTTATGA GCCATATTCA ACGGGAACG
901 TCGAGGCCGC GATTAAATTC CAACATGGAT GCTGATTTAT ATGGGTATAA ATGGGCTCGC
961 GATAATGTCG GGCAATCAGG TGCGACAATC TATCGCTTGT ATGGGAAGCC CGATGCGCCA
1021 GAGTTGTTTT TGAAACATGG CAAAGGTAGC GTTGCCAATG ATGTTACAGA TGAGATGGTC
1081 AGACTAAACT GGCTGACGGA ATTTATGCCT CTTCCGACCA TCAAGCATTT TATCCGTA
1141 CCTGATGATG CATGGTTACT CACCACTGCG ATCCCCGGAA AAACAGCATT CCAGGTATTA
1201 GAAGAATATC CTGATTCAGG TGAAAATATT GTTGATGCGC TGGCAGTGTC CCTGCGCCGG
1261 TTGCATTGCA TTCCTGTTTG TAATTGTCCT TTTAACAGCG ATCGCGTATT TCGTCTCGCT
1321 CAGGCGCAAT CACGAATGAA TAACGGTTTG GTTGATGCGA GTGATTTTGA TGACGAGCGT
1381 AATGGCTGGC CTGTTGAACA AGTCTGGAAA GAAATGCATA AACTTTTGGC ATTCTCACCG
1441 GATTCAGTCG TCACTCATGG TGATTTCTCA CTTGATAACC TTATTTTGA CGAGGGGAAA
1501 TTAATAGGTT GTATTGATGT TGGACGAGTC GGAATCGCAG ACCGATACCA GGATCTTGCC
1561 ATCCTATGGA ACTGCCTCGG TGAGTTTTCT CCTTCATTAC AGAAACGGCT TTTTCAAAAA
1621 TATGGTATTG ATAATCCTGA TATGAATAAA TTGCAGTTTC ATTTGATGCT CGATGAGTTT
1681 TTCTAATCAG AATTGGTTAA TTGGTTGTAA CATTATTCAG ATTGGGCCCC GTTCCACTGA
1741 GCGTCAGACC CCGTAGAAAA GATCAAAGGA TCTTCTTGAG ATCCTTTTTT TCTGCGCGTA
1801 ATCTGCTGCT TGCAAACAAA AAAACCCACG CTACCAGCGG TGTTTGTGTT GCQGGATCAA
1861 GAGCTACCAA CTCTTTTCC GAAGGTAAC TGGCTTCAGCA GAGCGCAGAT ACCAAATACT
1921 GTTCTTCTAG TGTAGCCGTA GTTAGGCCAC CACTTCAAGA ACTCTGTAGC ACCGCCTACA
1981 TACCTCGCTC TGCTAATCCT GTTACCAGTG GCTGCTGCCA GTGGCGATAA GTCGTGTCTT
2041 ACCGGGTTGG ACTCAAGACG ATAGTTACCG GATAAGGCGC AGCGGTCGGG CTGAACGGGG
2101 GGTTCGTGCA CACAGCCAG CTTGGAGCGA ACGACCTACA CCGAACTGAG ATACCTACAG
2161 CGTGAGCTAT GAGAAAGCGC CACGCTTCCC GAAGGGAGAA AGGCGGACAG GTATCCGGTA
2221 AGCGGCAGGG TCGGAACAGG AGAGCGCACG AGGGAGCTTC CAGGGGAAA CGCCTGGTAT
2281 CTTTATAGTC CTGTGCGGTT TCGCCACCTC TGACTTGAGC GTCGATTTTT GTGATGCTCG
2341 TCAGGGGGGC GGAGCCTATG GAAAAACGCC AGCAACGCGG CCTTTTACG GTTCTGGCC
2401 TTTTGCTGGC CTTTGTCTCA CATGTTCTTT CCTGCGTTAT CCCCTGATT TGTGGATAAC
2461 CGTATTACCG CTAGCATGGA TCTCGGGGAC GTCTAACTAC TAAGCGAGAG GGCCTTTCGT TTTATCTGTT
2521 CCAGGCATCA AATAAACGAA AAGGCTCAGT CGGAAGACTG GGCCTTTCGT TTTATCTGTT
2581 GTTTGTGCGT GAACGCTCTC CTGAGTAGGA CAAATCCGCC GGGAGCGGAT TTGAACGTTG
2641 TGAAGCAACG GCGCGGAGG TGGCGGGCAG GACGCCCGCC ATAAACTGCC AGGCATCAAA
2701 CTAAGCAGAA GGCCATC

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FIGURE 10B

THE BIBLE



pENTR2B 2718 bp

Location (Base Nos.)	Gene Encoded
67..166	attL1
322..627	ccdB
656..755	attL2
878..1687	KmR
1792..2365	ori

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1 CTGACGGATG GCCTTTTTTGC GTTTCTACAA ACTCTTCCTG TTAGTTAGTT ACTTAAGCTC
61 GGGCCCCAAA TAATGATTTT ATTTTGACTG ATAGTGACCT GTTCGTTGCA ACAAATTGAT
121 AAGCAATGCT TTTTATAAAT GCCAACTTTG TACAAAAAAG CAGGCTGGCG CCGGAACCAA
181 TTCAGTCGAC TGGATCCGGT ACCGAATTCG CTTACTAAAA GCCAGATAAC AGTATGCGTA
241 TTTGCGCGCT GATTTTTTGC GTATAAGAAT ATATACTGAT ATGTATACCC GAAGTATGTC
301 AAAAAGAGGT GTGCTTCTAG AATGCAGTTT AAGGTTTACA CCTATAAAAG AGAGAGCCGT
361 TATCGTCTGT TTGTGGATGT ACAGAGTGAT ATTATTGACA CGCCCGGGCG ACGGATGGTG
421 ATCCCCCTGG CCAGTGCACG TCTGCTGTCA GATAAAGTCT CCCGTGAACT TTACCCGGTG
481 GTGCATATCG GGGATGAAAG CTGGCGCATG ATGACCACCG ATATGGCCAG TGTGCCGGTC
541 TCCGTTATCG GGGAAGAAGT GGCTGATCTC AGCCACCGCG AAAATGACAT CAAAAACGCC
601 ATTAACCTGA TGTTCTGGGG AATATAGAAT TCGCGGCCGC ACTCGAGATA TCTAGACCCA
661 GCTTCTTGT ACAAAGTTGG CATTATAAGA AAGCATTGCT TATCAATTTG TTGCAACGAA
721 CAGGTCAC TAAGTCAAAA TAAAATCATT ATTTGCCATC CAGCTGCAGC TCTGGCCCCG
781 GTCTCAAAAT CTCTGATGTT ACATTGCACA AGATAAAAAT ATATCATCAT GAACAATAAA
841 ACTGTCTGCT TACATAAACA GTAATACAAG GGGTGTTATG AGCCATATTC AACGGGAAAC
901 GTCGAGGCCG CGATTAAATT CCAACATGGA TGCTGATTTA TATGGGTATA AATGGGCTCG
961 CGATAATGTC GGGCAATCAG GTGCGACAAT CTATCGCTTG TATGGGAAGC CCGATGCGCC
1021 AGAGTTGTTT CTGAAACATG GCAAAGGTAG CGTTGCCAAT GATGTTACAG ATGAGATGGT
1081 CAGACTAAAC TGGCTGACGG AATTATATGCC TCTTCCGACC ATCAAGCATT TTATCCGTAC
1141 TCCTGATGAT GCATGGTTAC TCACCACTGC GATCCCCGGA AAAACAGCAT TCCAGGTATT
1201 AGAAGAATAT CCTGATTCAG GTGAAAATAT TGTTGATGCG CTGGCAGTGT TCCTGCGCCG
1261 GTTGCAATCG ATTCTGTGTT GTAATTGTCC TTTTAACAGC GATCGCGTAT TTCGTCTCGC
1321 TCAGGCGCAA TCACGAATGA ATAACGGTTT GGTTGATGCG AGTGATTTTG ATGACGAGCG
1381 TAATGGCTGG CCTGTTGAAC AAGTCTGGAA AGAAATGCAT AAACCTTTTG CATTCTCACC
1441 GGATTGAGTC GTCATCATG GTGATTTCTC ACTTGATAAC CTTATTTTGT ACGAGGGGAA
1501 ATTAATAGGT TGTATTGATG TTGGACGAGT CGGAATCGCA GACCGATACC AGGATCTTGC
1561 CATCCTATGG AACTGCCTCG GTGAGTTTTC TCCTTCATTA CAGAAACGGC TTTTTCAAAA
1621 ATATGGTATT GATAATCCTG ATATGAATAA ATTGCAGTTT CATTTGATGC TCGATGAGTT
1681 TTTCTAATCA GAATTGGTTA ATTGGTTGTA ACATTATTCA GATTGGGCCC CGTTCCTACTG
1741 AGCGTCAGAC CCCGTAGAAA AGATCAAAGG ATCTTCTTGA GATCCTTTTT TTCTGCGCGT
1801 AATCTGCTGC TTGCAAACAA AAAAACCACC GCTACCAGCG GTGGTTTGTT TGCCGGATCA
1861 AGAGCTACCA ACTCTTTTTT CGAAGGTAACT TGGCTTCAGC AGAGCGCAGA TACCAAATAC
1921 TGTTCTTCTA GTGTAGCCGT AGTTAGGCCA CCACTTCAAG AACTCTGTAG CACCGCCTAC
1981 ATACCTCGCT CTGCTAATCC TGTTACCAGT GGCTGCTGCC AGTGGCGATA AGTCGTGTCT
2041 TACCGGGTTG GACTCAAGAC GATAGTTACC GGATAAGGCG CAGCGGTCGG GCTGAACGGG
2101 GGGTTTCGTG ACACAGCCCA GCTTGAGCG AACGACCTAC ACCGAACTGA GATACCTACA
2161 GCGTGAGCTA TGAGAAAGCG CCACGCTTCC CGAAGGGAGA AAGGCGGACA GGTATCCGGT
2221 AAGCGGCAGG GTCGGAACAG GAGAGCGCAC GAGGGAGCTT CCAGGGGGAA ACGCCTGGTA
2281 TCTTTATAGT CCTGTCGGGT TTCGCCACCT CTGACTTGAG CGTCGATTTT TGTGATGCTC
2341 GTCAGGGGGG CGGAGCCTAT GGAAAAACGC CAGCAACGCG GCCTTTTTTAC GGTTCTCTGGC
2401 CTTTGTGCTG CTTTTTGCTC ACATGTTCTT TCCTGCGTTA TCCCCTGATT CTGTGGATAA
2461 CCGTATTACC GCTAGCATGG ATCTCGGGGA CGTCTAACTA CTAAGCGAGA GTAGGGAACT
2521 GCCAGGCATC AAATAAACG AAAGGCTCAG TCGGAAGACT GGGCCTTTTCG TTTTATCTGT
2581 TGTTTGTGCG TGAACGCTCT CCTGAGTAGG ACAAATCCGC CGGGAGCGGA TTTGAACGTT
2641 GTGAAGCAAC GGCCCGGAGG GTGGCGGGCA GGACGCCCGC CATAAATGTC CAGGCATCAA
2701 ACTAAGCAGA AGGCCATC

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Figure 11B

Figure 12A: Cloning Sites of the Entry Vector pENTR3C (reading frame C)

Int	attL1		DraI		XmnI		SalI		BamHI								
TTG	TAC	AAA	AAA	GCA	GGC	TCT	TTA	AAG	GAA	CCA	ATT	CAG	TCG	ACT	GGA	TCC	GGT
AAC	ATG	TTT	TTT	CGT	CCG	AGA	AAT	TTC	CTT	GGT	TAA	GTC	AGC	TGA	CCT	AGG	CCA
							↓			↓				↓		↓	↓
Leu	Tyr	Lys	Lys	Ala	Gly	Ser	Leu	Lys	Glu	Pro	Ile	Gln	Ser	Thr	Gly	Ser	Gly

KpnI	EcoRI		PvuI		EcoRI		NotI		XhoI		EcoRV	XbaI			
AGC	GAA	TTC	GAT	CGC--	ccdB	--G	AAT	TCG	CGG	CCG	CAC	TCG	AGA	TAT	CTA
TGG	CTT	AAG	CTA	GCG		C	TTA	AGC	GCC	GGC	GTG	AGC	TCT	ATA	GAT
			↓				↓		↓			↓		↓	
Thr	Glu	Phe					Asn	Ser	Arg	Pro	His	Ser	Arg	Tyr	Leu

attL2		Int					
GAC	CCA	GCT	TTC	TTG	TAC	AAA	G
CTG	GGT	CGA	AAG	AAC	ATG	TTT	C
			↓				
Asp	Pro	Ala	Phe	Leu	Tyr	Lys	

003060 "attL1" 003060

pENTR3C 2723 bp

Location (Base Nos.)	Gene Encoded
67..166	attL1
327..632	ccdB
661..760	attL2
883..1692	KmR
1797..2370	ori

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1 CTGACGGATG GCCTTTTTGC GTTTCTACAA ACTCTTCCTG TTAGTTAGTT ACTTAAGCTC
61 GGGCCCCAAA TAATGATTTT ATTTTGACTG ATAGTGACCT GTTCGTTGCA ACAAATTGAT
121 AAGCAATGCT TTTTATAAT GCCAACTTTG TACAAAAAAG CAGGCTCTTT AAAGGAACCA
181 ATTCAAGTCG CTGGATCCGG TACCGAATTC GATCGCTTAC TAAAAGCCAG ATAACAGTAT
241 GCGTATTTGC GCGCTGATT TTGCGGTATA AGAATATATA CTGATATGTA TACCCGAAGT
301 ATGTCAAAAA GAGGTGTGCT TCTAGAATGC AGTTTAAGGT TTACACCTAT AAAAGAGAGA
361 GCCGTATTCG TCTGTTGTG GATGTACAGA GTGATATTAT TGACACGCCG GGGCGACGGA
421 TGGTGATCCC CCTGGCCAGT GCACGTCTGC TGTCAGATAA AGTCTCCCGT GAACTTTACC
481 CGGTGGTGCA TATCGGGGAT GAAAGCTGGC GCATGATGAC CACCGATATG GCCAGTGTGC
541 CGGTCTCCGT TATCGGGGAA GAAGTGGCTG ATCTCAGCCA CCGCGAAAAT GACATCAAAA
601 ACGCCATTAA CCTGATGTTT TGGGGAATAT AGAATTCGCG GCCGCACTCG AGATATCTAG
661 ACCCAGCTTT CTTGTACAAA GTTGGCATT TAAGAAAGCA TTGCTTATCA ATTTGTTGCA
721 ACGAACAGGT CACTATCAGT CAAAATAAAA TCATTATTTG CCATCCAGCT GCAGCTCTGG
781 CCCGTGTCTC AAAATCTCTG ATGTTACATT GCACAAGATA AAAATATATC ATCATGAACA
841 ATAAAACTGT CTGCTTACAT AAACAGTAAT ACAAGGGGTG TTATGAGCCA TATTCAACGG
901 GAAACGTCGA GGCCGCGATT AAATTC AAC ATGGATGCTG ATTTATATGG GTATAAATGG
961 GCTCGCGATA ATGTCGGGCA ATCAGGTGCG ACAATCTATC GCTTGATGG GAAGCCCGAT
1021 GCGCCAGAGT TGTTCCTGAA ACATGGCAAA GGTAGCGTTG CCAATGATGT TACAGATGAG
1081 ATGGTCAGAC TAAACTGGCT GACGGAATTT ATGCCCTCTC CGACCATCAA GCATTTTATC
1141 CGTACTCCTG ATGATGCATG GTTACTACCC ACTGCGATCC CCGGAAAAAC AGCATTCCAG
1201 GTATTAGAAG AATATCCTGA TTCAGGTGAA AATATTGTTG ATGCGCTGGC AGTGTTCTCTG
1261 CTCCGGTTGC ATTCGATTCC TGTTTGTAAT TGTCTTTT ACAGCGATCG CGTATTTCTG
1321 CTCGCTCAGG CGCAATCACG AATGAATAAC GGTTTGTTG ATGCGAGTGA TTTTGATGAC
1381 GAGCGTAATG GCTGGCCTGT TGAACAAGTC TGGAAAGAAA TGCATAAACT TTTGCCATT
1441 TCACCGGATT CAGTCGTCAC TCATGGTGAT TTCTCACTG ATAACCTTAT TTTTGACGAG
1501 GGGAAATTAA TAGGTTGTAT TGATGTTGGA CGAGTCGGA TCGCAGACCG ATACCAGGAT
1561 CTTGCCATCC TATGGAAGTC CCTCGGTGAG TTTTCTCCTT CATTACAGAA ACGGCTTTTT
1621 CAAAAATATG GTATTGATAA TCCTGATATG AATAAATTGC AGTTTCATTG ATGCTCGAT
1681 GAGTTTTTCT AATCAGAATT GGTTAATTGG TTGTAACATT ATTCAGATTG GGCCCCGTTT
1741 CACTGAGCGT CAGACCCCGT AGAAAAAGATC AAAGGATCTT CTTGAGATCC TTTTTTCTG
1801 CGCGTAATCT GCTGCTTGCA AACAAAAAAA CCACCGCTAC CAGCGGTGGT TTGTTTGCCG
1861 GATCAAGAGC TACCAACTCT TTTCCGAAG GTAACGGCT TCAGCAGAGC GCAGATACCA
1921 AATACTGTTT TTCTAGTGTA GCCGTAGTTA GGCCACCACT TCAAGAATC TGTAGCACCG
1981 CCTACATACC TCGCTCTGCT AATCCTGTTA CCAGTGGCTG CTGCCAGTGG CGATAAGTCG
2041 TGTCTTACCG GGTGGAATC AAGACGATAG TTACCGGATA AGGCGCAGCG GTCGGGCTGA
2101 ACGGGGGGTT CGTGACACACA GCCCAGCTTG GAGCGAACGA CCTACACCGA ACTGAGATAC
2161 CTACAGCGTG AGCTATGAGA AAGCGCCACG CTTCCCGAAG GGAGAAAGGC GGACAGGTAT
2221 CCGGTAAGCG GCAGGGTCGG AACAGGAGAG CGCACGAGGG AGCTTCCAGG GGGAAACGCC
2281 TGGTATCTTT ATAGTCCTGT CGGGTTTCGC CACCTCTGAC TTGAGCGTCG ATTTTGTGA
2341 TGCTCGTCAG GGGGGCGGAG CCTATGGAAG AACGCCAGCA ACGCGGCCCT TTTACGGTTC
2401 CTGGCCTTTT GCTGGCCTTT TGCTCACATG TTCTTTCCTG CGTTATCCCC TGATTCTGTG
2461 GATAACCGTA TTACCGCTAG CATGGATCTC GGGGACGTCT AACTACTAAG CGAGAGTAGG
2521 GAACTGCCAG GCATCAAATA AAACGAAAGG CTCAGTCGGA AGACTGGGCC TTTCGTTTTA
2581 TCTGTTGTTT GTCGGTGAAC GCTCTCCTGA GTAGGACAAA TCCGCCGGA GCGGATTTGA
2641 ACGTTGTGAA GCAACGGCCC GGAGGGTGGC GGGCAGGACG CCCGCCATAA ACTGCCAGGC
2701 ATCAAATAA GCAGAAGGCC ATC

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FIGURE 12B

pENTR4 2720 bp

Location (Base Nos.)	Gene Encoded
67..166	attL1
324..629	ccdB
658..757	attL2
880..1689	KmR
1794..2367	ori

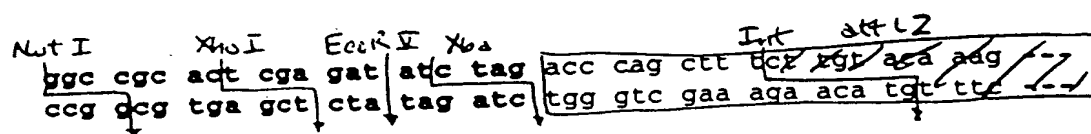
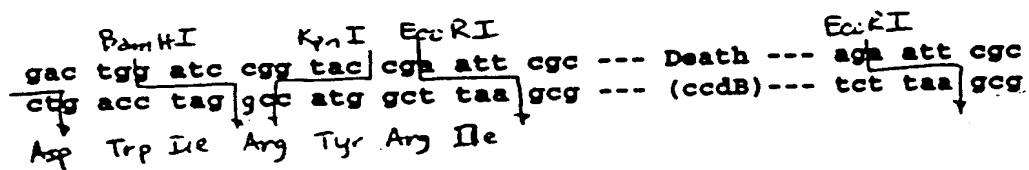
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121 AAGCAATGCT TTTTATAAT GCCAACTTTG TACAAAAAAG CAGGCTCCAC CATGGGAACC
181 AATTCAGTCG ACTGGATCCG GTACCGAATT CGCTTACTAA AAGCCAGATA ACAGTATGCG
241 TATTTGCGCG CTGATTTTTG CGGTATAAGA ATATATACTG ATATGTATAC CCGAAGTATG
301 TCAAAAAGAG GTGTGCTTCT AGAATGCAGT TTAAGGTTTA CACCTATAAA AGAGAGAGCC
361 GTTATCGTCT GTTTGTGGAT GTACAGAGTG ATATTATTGA CACGCCCCGG CGACGGATGG
421 TGATCCCCCT GGCCAGTGCA CGTCTGCTGT CAGATAAAGT CTCCCGTGAA CTTTACCCGG
481 TGGTGCATAT CGGGGATGAA AGCTGGCGCA TGATGACCAC CGATATGGCC AGTGTGCCGG
541 TCTCCGTTAT CGGGGAAGAA GTGGCTGATC TCAGCCACCG CGAAAATGAC ATCAAAAACG
601 CCATTAACCT GATGTTCTGG GGAATATAGA ATTCGCGGCC GCACTCGAGA TATCTAGACC
661 CAGCTTTCTT GTACAAAGTT GGCATTATAA GAAAGCATTG CTTATCAATT TGTGCAACG
721 AACAGGTCAC TATCAGTCAA AATAAAATCA TTATTTGCCA TCCAGCTGCA GCTCTGGCCC
781 GTGTCTCAAA ATCTCTGATG TTACATTGCA CAAGATAAAA ATATATCATC ATGAACAATA
841 AAAGTGTCTG CTTACATAAA CAGTAATACA AGGGGTGTTA TGAGCCATAT TCAACGGGAA
901 ACGTCGAGGC CGCGATTAAA TTCCAACATG GATGCTGATT TATATGGGTA TAAATGGGCT
961 CGCGATAATG TCGGGCAATC AGGTGCGACA ATCTATCGCT TGTATGGGAA GCCCGATGCG
1021 CCAGAGTTGT TTCTGAAACA TGGCAAAGGT AGCGTTGCCA ATGATGTTAC AGATGAGATG
1081 GTCAGACTAA ACTGGCTGAC GGAATTTATG CCTCTTCCGA CCATCAAGCA TTTTATCCGT
1141 ACTCCTGGTG ATGCATGGTT ACTCACTACT GCGATCCCCG GAAAAACAGC ATTCCAGGTA
1201 TTAGAAGAAT ATCCTGATTC AGGTGAAAAT ATTGTTGATG CGCTGGCAGT GTTCCTGCGC
1261 CGGTTGCATT CGATTCTCTG TTGTAATTGT CCTTTTAACA GCGATCGCGT ATTTCTGCTC
1321 GCTCAGGCGC AATCACGAAT GAATAACGGT TTGGTTGATG CGAGTGATTT TGATGACGAG
1381 CGTAATGGCT GGCCTGTTGA ACAAGTCTGG AAAGAAATGC ATAAACTTTT GCCATTCTCA
1441 CCGGATTCAG TCGTCACTCA TGGTGATTTT TCACTTGATA ACCTTATTTT TGACGAGGGG
1501 AAATTAATAG GTTGATTGTA TGTTGGACGA GTCGGAATCG CAGACCGATA CCAGGATCTT
1561 GCCATCCTAT GGAAGTGCCT CGGTGAGTTT TCTCCTTCAT TACAGAAACG GCTTTTCAA
1621 AAATATGGTA TTGATAATCC TGATATGAAT AAATTGCAGT TTCATTTGAT GCTCAGTATG
1681 TTTTCTAAT CAGAATTGGT TAATTGGTTG TAACATTATT CAGATTGGGC CCCGTTCCAC
1741 TGAGCGTCAG ACCCCGTAGA AAAGATCAAA GGATCTTCTT GAGATCCTTT TTTTCTGCGC
1801 GTAATCTGCT GCTTGCAAAC AAAAAACCA CCGCTACCAG CGGTGGTTTG TTTGCCGGAT
1861 CAAGAGCTAC CAACTCTTTT TCCGAAGGTA ACTGGCTTCA GCAGAGCGCA GATACCAAAT
1921 ACTGTTCTTC TAGTGTAGCC GTAGTTAGGC CACCACTTCA AGAACTCTGT AGCACCCTCT
1981 ACATACCTCG CTCTGCTAAT CCTGTTACCA GTGGCTGCTG CCAGTGGCGA TAAGTCGTGT
2041 CTTACCGGGT TGGACTCAAG ACGATAGTTA CCGGATAAGG CGCAGCGGTC GGGCTGAACG
2101 GGGGGTTTCG GCACACAGCC CAGCTTGGAG CGAACGACCT ACACCGAACT GAGATACCTA
2161 CAGCGTGAGC TATGAGAAAG CGCCACGCTT CCCGAAGGGA GAAAGGCGGA CAGGTATCCG
2221 GTAAGCGGCA GGGTCGGAAC AGGAGAGCGC ACGAGGGAGC TTCCAGGGGG AAACGCCTGG
2281 TATCTTTTATA GTCCTGTCGG GTTTCGCCAC CTCTGACTTG AGCGTCGATT TTTGTGATGC
2341 TCGTCAGGGG GGCGGAGCCT ATGGAAAAAC GCCAGCAACG CGGCCTTTT ACGGTTCCTG
2401 GCCTTTTGCT GGCCTTTTGC TCACATGTTT TTTCTGCGT TATCCCCTGA TTCTGTGGAT
2461 AACCGTATTA CCGCTAGCAT GGATCTCGGG GACGTCTAAC TACTAAGCGA GAGTAGGGAA
2521 CTGCCAGGCA TCAAATAAAA CGAAAGGCTC AGTCGGAAGA CTGGGCCTTT CGTTTTATCT
2581 GTTGTGTTGTC GGTGAACGCT CTCCTGAGTA GGACAAATCC GCCGGGAGCG GATTTGAACG
2641 TTGTGAAGCA ACGGCCCGGA GGGTGGCGGG CAGGACGCCC GCCATAAACT GCCAGGCATC
2701 AAATAAGCA GAAGGCCATC

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FIGURE 13B

THE UNIVERSITY OF CHICAGO



pENTR5 2720 bp

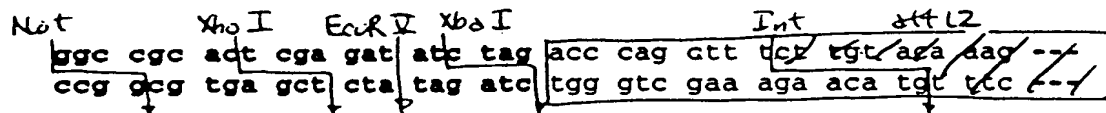
<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
67..166	attL1
324..629	ccdB
658..757	attL2
880..1689	KmR
1794..2367	ori

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1 CTGACGGATG GCCTTTTTGC GTTTCTACAA ACTCTTCCTG TTAGTTAGTT ACTTAAGCTC
61 GGGCCCCAAA TAATGATTTT ATTTTGACTG ATAGTGACCT GTTCGTTGCA ACAAATTGAT
121 AAGCAATGCT TTTTATAAT GCCAACTTTG TACAAAAAAG CAGGCTTTCA TATGGGAACC
181 AATTCAGTCG ACTGGATCCG GTACCGAATT CGCTTACTAA AAGCCAGATA ACAGTATGCG
241 TATTTGCGCG CTGATTTTTG CGGTATAAGA ATATATACTG ATATGTATAC CCGAAGTATG
301 TCAAAAAGAG GTGTGCTTCT AGAATGCAGT TTAAGGTTTA CACCTATAAA AGAGAGAGCC
361 GTTATCGTCT GTTTGTGGAT GTACAGAGTG ATATTATTGA CACGCCCCGG CGACGGATGG
421 TGATCCCCCT GGCCAGTGCA CGTCTGCTGT CAGATAAAGT CTCCCGTGAA CTTTACCCGG
481 TGGTGCATAT CGGGGATGAA AGCTGGCGCA TGATGACCAC CGATATGGCC AGTGTGCCGG
541 TCTCCGTTAT CGGGGAAGAA GTGGCTGATC TCAGCCACCG CGAAAATGAC ATCAAAAACG
601 CCATTAACCT GATGTTCTGG GGAATATAGA ATTCGCGGCC GCACTCGAGA TATCTAGACC
661 CAGCTTTCTT GTACAAAGTT GGCATTATAA GAAAGCATTG CTTATCAATT TGTGCAACG
721 AACAGGTCAC TATCAGTCAA AATAAAATCA TTATTTGCCA TCCAGCTGCA GCTCTGGCCC
781 GTGTCTCAA ATCTCTGATG TTACATTGCA CAAGATAAAA ATATATCATC ATGAACAATA
841 AAACGTCTCG CTTACATAAA CAGTAATACA AGGGGTGTTA TGAGCCATAT TCAACGGGAA
901 ACGTCGAGGC CGCGATTAAA TTCCAACATG GATGCTGATT TATATGGGTA TAAATGGGCT
961 CGCGATAATG TCGGGCAATC AGGTGCGACA ATCTATCGCT TGTATGGGAA GCCCGATGCG
1021 CCAGAGTTGT TTCTGAAACA TGGCAAAGGT AGCGTTGCCA ATGATGTTAC AGATGAGATG
1081 GTCAGACTAA ACTGGCTGAC GGAATTTATG CCTCTTCCGA CCATCAAGCA TTTTATCCGT
1141 ACTCCTGATG ATGCATGGTT ACTCACCACT GCGATCCCCG GAAAAACAGC ATTCCAGGTA
1201 TTAGAAGAAT ATCCTGATTG AGGTGAAAAT ATTGTTGATG CGCTGGCAGT GTTCCTGCGC
1261 CGGTTGCATT CGATTCCCTGT TTGTAATTGT CCTTTTAACA GCGATCGCGT ATTTCTGCTC
1321 GCTCAGGCGC AATCACGAAT GAATAACGGT TTGGTTGATG CGAGTGATTT TGATGACGAG
1381 CGTAATGGCT GGCCTGTTGA ACAAGTCTGG AAAGAAATGC ATAAACTTTT GCCATTCTCA
1441 CCGGATTTCAG TCGTCACTCA TGGTGATTTT TCACTTGATA ACCTTATTTT TGACGAGGGG
1501 AAATTAATAG GTTGTATTGA TGTGAGACGA GTCGGAATCG CAGACCGATA CCAGGATCTT
1561 GCCATCCTAT GGAAGTGCCT CGGTGAGTTT TCTCCTTCAT TACAGAAACG GCTTTTTTCAA
1621 AAATATGGTA TTGATAATCC TGATATGAAT AAATTGCAGT TTCATTTGAT GCTCGATGAG
1681 TTTTCTCTAAT CAGAATTGGT TAATTGGTTG TAACATTATT CAGATTGGGC CCCGTTCCAC
1741 TGAGCGTCAG ACCCCGTAGA AAAGATCAAA GGATCTTCTT GAGATCCTTT TTTTCTGCGC
1801 GTAATCTGCT GCTTGCAAAC AAAAAACCA CCGTACCAG CGGTGGTTTG TTTGCCGGAT
1861 CAAGAGCTAC CAACTCTTTT TCCGAAGGTA ACTGGCTTCA GCAGAGCGCA GATACCAAAT
1921 ACTGTTCTTC TAGTGTAGCC GTAGTTAGGC CACCACTTCA AGAACTCTGT AGCACCAGCT
1981 ACATACCTCG CTCTGCTAAT CCTGTTACCA GTGGCTGCTG CCAGTGGCGA TAAGTCGTGT
2041 CTTACCGGGT TGGACTCAAG ACGATAGTTA CCGGATAAGG CGCAGCGGTC GGGCTGAACG
2101 GGGGGTTTCGT GCACACAGCC CAGCTTGGAG CGAACGACCT ACACCGAACT GAGATACCTA
2161 CAGCGTGAGC TATGAGAAAG CGCCACGCTT CCCGAAGGGA GAAAGGCGGA CAGGTATCCG
2221 GTAAGCGGCA GGGTCGGAAC AGGAGAGCGC ACGAGGGAGC TTCCAGGGGG AAACGCCTGG
2281 TATCTTTATA GTCCTGTCGG GTTTCGCCAC CTCTGACTTG AGCGTCGATT TTTGTGATGC
2341 TCGTCAGGGG GCGGAGCCT ATGGAAAAAC GCCAGCAACG CGGCCTTTT ACCTGTCCTG
2401 GCCTTTTGCT GGCCTTTTGC TCACATGTTT TTTCTGCGT TATCCCTGTA TTCTGTGGAT
2461 AACCCTATTA CCGCTAGCAT GGATCTCGGG GACGTCTAAC TACTAAGCGA GAGTAGGGAA
2521 CTGCCAGGCA TCGAATAAAA CGAAAGGCTC AGTCGGAAGA CTGGGCCTTT CGTTTTATCT
2581 GTTGTGTTGTC GGTGAACGCT CTCCTGAGTA GGACAAATCC GCCGGGAGCG GATTTGAACG
2641 TTGTGAAGCA ACGGCCCGGA GGGTGGCGGG CAGGACGCCC GCCATAAACT GCCAGGCATC
2701 AAATAAGCA GAAGGCCATC

```

Figure 14B

[illegible]

pENTR6 2717 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
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321..626	ccdB
655..754	attL2
877..1686	KmR
1791..2364	ori

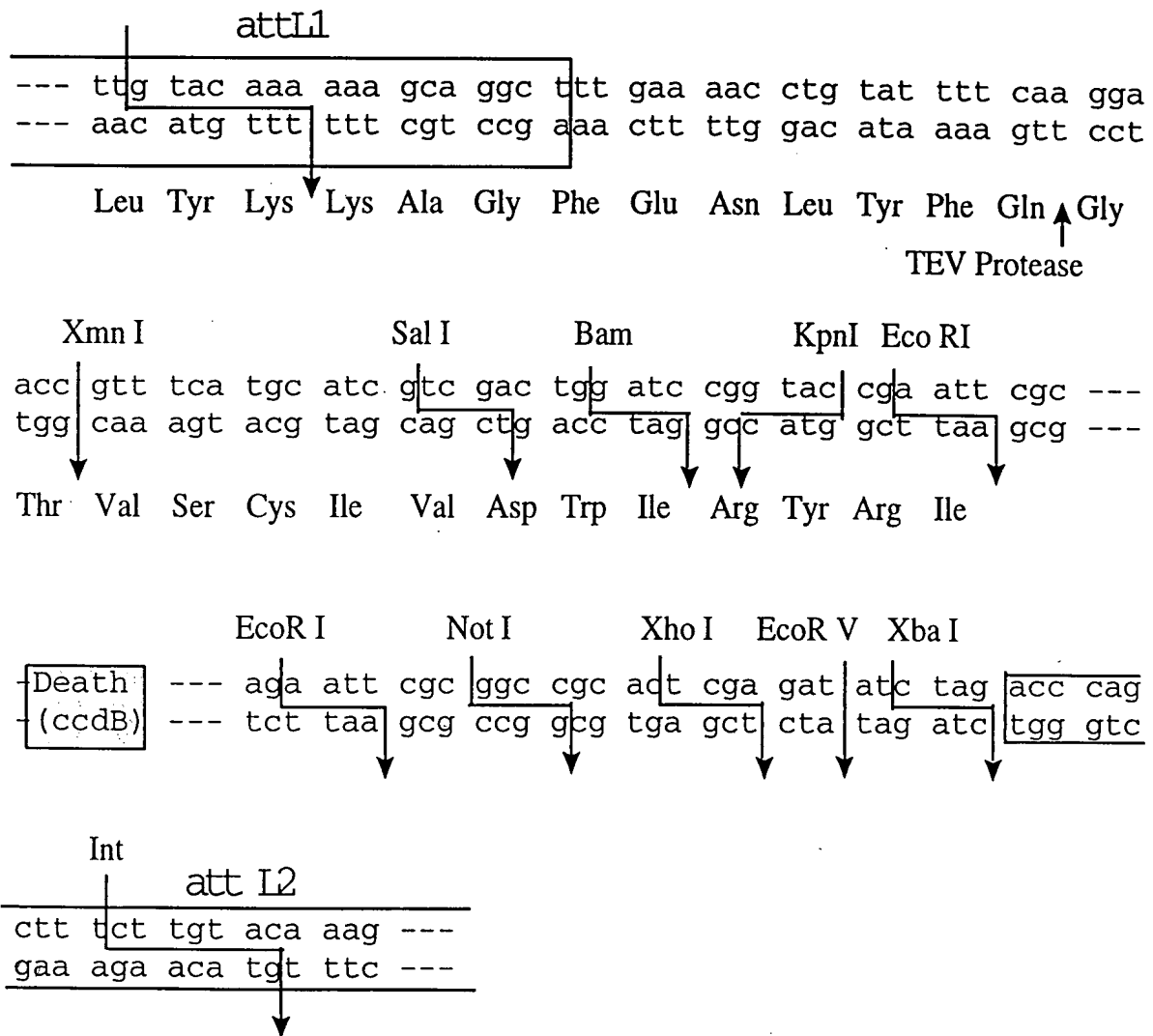
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121 AAGCAATGCT TTTTATAAAT GCCAACTTTG TACAAAAAAG CAGGCTGCAT GCGAACCAAT
181 TCAGTCGACT GGATCCGGTA CCGAATTTCG TTAATAAAG CCAGATAACA GTATGCGTAT
241 TTGCGCGCTG ATTTTTCGGG TATAAGAATA TATACTGATA TGTATACCCG AAGTATGTCA
301 AAAAGAGGTG TGCTTCTAGA ATGCAGTTTA AGGTTTACAC CTATAAAAGA GAGAGCCGTT
361 ATCGTCTGTT TGTGGATGTA CAGAGTGATA TTATTGACAC GCCCGGGCGA CGGATGGTGA
421 TCCCCCTGGC CAGTGCACGT CTGCTGTCAG ATAAAGTCTC CCGTGAACCT TACCCGGTGG
481 TGCATATCGG GGATGAAAGC TGGCGCATGA TGACCACCGA TATGGCCAGT GTGCCGGTCT
541 CCGTTATCGG GGAAGAAGTG GCTGATCTCA GCCACCGCGA AAATGACATC AAAAACGCCA
601 TTAACCTGAT GTTCTGGGGA ATATAGAATT CGCGGCCGCA CTCGAGATAT CTAGACCCAG
661 CTTTCTTGTA CAAAGTTGGC ATTATAAGAA AGCATTGCTT ATCAATTTGT TGCAACGAAC
721 AGGTCACAT CAGTCAAAAT AAAATCATT TTTGCCATCC AGCTGCAGCT CTGGCCCGTG
781 TCTCAAAATC TCTGATGTTA CATTGCACAA GATAAAAATA TATCATCATG AACAATAAAA
841 CTGTCTGCTT ACATAAACAG TAATACAAGG GGTGTTATGA GCCATATTCA ACGGGAAACG
901 TCGAGGCCGC GATTAAATTC CAACATGGAT GCTGATTTAT ATGGGTATAA ATGGGCTCGC
961 GATAATGTCG GGCAATCAGG TGCACAATC TATCGCTTGT ATGGGAAGCC CGATGCGCCA
1021 GAGTTGTTTC TGAAACATGG CAAAGGTAGC GTTGCCAATG ATGTTACAGA TGAGATGGTC
1081 AGACTAAACT GGCTGACGGA ATTTATGCCT CTTCCGACCA TCAAGCATT TATCCGTACT
1141 CCTGATGATG CATGGTTACT CACCCTGCG ATCCCCGGA AAACAGCATT CCAGGTATTA
1201 GAAGAATATC CTGATTCAGG TGAAAATATT GTTGATGCGC TGGCAGTGTT CCTGCGCCGG
1261 TTGCATTCGA TTCCTGTTTG TAATTGTCCT TTTAACAGCG ATCGCGTATT TCGTCTCGCT
1321 CAGGCGCAAT CACGAATGAA TAACGGTTTG GTTGATGCGA GTGATTTTGA TGACGAGCGT
1381 AATGGCTGGC CTGTTGAACA AGTCTGGAAA GAAATGCATA AACTTTTGCC ATTCTCACCG
1441 GATTCACTCG TCACTCATGG TGATTTCTCA CTTGATAACC TTATTTTGA CGAGGGGAAA
1501 TTAATAGGTT GTATTGATGT TGGACGAGTC GGAATCGCAG ACCGATACCA GGATCTTGCC
1561 ATCCTATGGA ACTGCCTCGG TGAGTTTTCT CCTTCATTAC AGAAACGGCT TTTTCAAAAA
1621 TATGGTATTG ATAATCCTGA TATGAATAAA TTGCAGTTTC ATTTGATGCT CGATGAGTTT
1681 TTCTAATCAG AATTGGTTAA TTGGTTGTAA CATTATTCAG ATTGGGCCCC GTTCCACTGA
1741 GCGTCAGACC CCGTAGAAAA GATCAAAGGA TCTTCTTGAG ATCCTTTTTT TCTGCGCGTA
1801 ATCTGCTGCT TGCAAACAAA AAAACCACCG CTACCAGCGG TGGTTTGTTT GCCGGATCAA
1861 GAGCTACCAA CTCTTTTTC GAAGGTAAC TGGCTTCAGCA GAGCGCAGAT ACCAAATACT
1921 GTTCTTCTAG TGTAGCCGTA GTTAGCCAC CACTTCAAGA ACTCTGTAGC ACCGCCTACA
1981 TACCTCGCTC TGCTAATCCT GTTACCAGTG GCTGCTGCCA GTGGCGATAA GTCGTGTCTT
2041 ACCGGGTTGG ACTCAAGACG ATAGTTACCG GATAAGGCGC AGCGGTCGGG CTGAACGGGG
2101 GGTTTCGTGA CACAGCCCAG CTTGGAGCGA ACGACCTACA CCGAAGTGA ATACCTACAG
2161 CGTGAGCTAT GAGAAAGCGC CACGCTTCCC GAAGGGAGAA AGGCGGACAG GTATCCGGTA
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2281 CTTTATAGTC CTGTCGGGTT TCGCCACCTC TGAATTGAGC GTCGATTTTT GTGATGCTCG
2341 TCAGGGGGGC GGAGCCTATG GAAAAACGCC AGCAACGCGG CCTTTTTTAC GTTCTGGGCC
2401 TTTTGCTGGC CTTTGTCTCA CATGTTCTTT CCTGCGTTAT CCCCTGATTC TGTGGATAAC
2461 CGTATTACCG CTAGCATGGA TCTCGGGGAC GTCTAACTAC TAAGCGAGAG TAGGGAACTG
2521 CCAGGCATCA AATAAACGA AAGGCTCAGT CGGAAGACTG GGCCTTTCGT TTTATCTGTT
2581 GTTTGTCTGGT GAACGCTCTC CTGAGTAGGA CAAATCCGCC GGGAGCGGAT TTGAACGTTG
2641 TGAAGCAACG GCCCGGAGG TGGCGGGCAG GACGCCCGCC ATAACTGCC AGGCATCAAA
2701 CTAAGCAGAA GGCCATC

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Figure 15B

Figure 16A: Cloning sites of the ENTRY Vector pENTRY



pENTR7 2738 bp

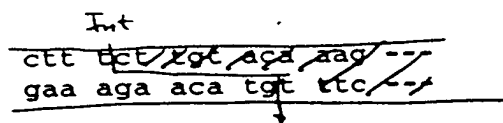
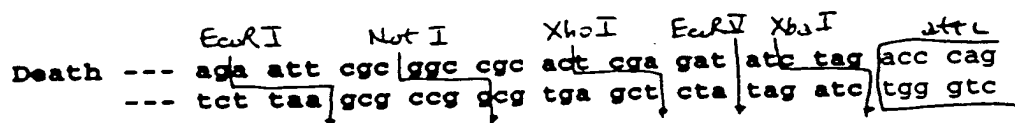
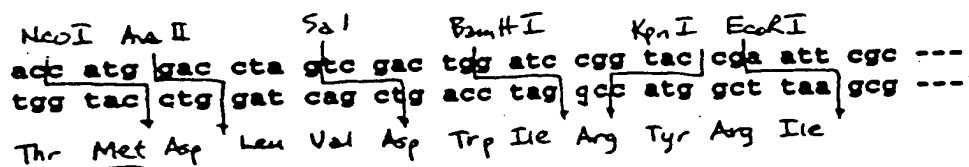
<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
67..166	attL1
342..647	ccdB
676..775	attL2
898..1707	KmR
1812..2385	ori

```

1 CTGACGGATG GCCTTTTTGC GTTTCTACAA ACTCTTCCTG TTAGTTAGTT ACTTAAGCTC
61 GGGCCCCAAA TAATGATTTT ATTTTGACTG ATAGTGACCT GTTCGTTGCA ACAAATTGAT
121 AAGCAATGCT TTTTATAAT GCCAACTTTG TACAAAAAAG CAGGCTTTGA AAACCTGTAT
181 TTTCAAGGAA CCGTTTCATG CATCGTCGCT TGGATCCGGT ACCGAATTCG CTTACTAAAA
241 GCCAGATAAC AGTATGCGTA TTTGCGCGCT GATTTTTGCG GTATAAGAAT ATATACTGAT
301 ATGTATACCC GAAGTATGTC AAAAAGAGGT GTGCTTCTAG AATGCAGTTT AAGGTTTACA
361 CCTATAAAAG AGAGAGCCGT TATCGTCTGT TTGTGGATGT ACAGAGTGAT ATTATTGACA
421 CGCCCCGGCG ACGGATAGTG ATCCCCCTGG CCAGTGCACG TCTGCTGTCA GATAAAGTCT
481 CCCGTGAACT TTACCCGGTG GTGCATATCG GGGATGAAAG CTGGCGCATG ATGACCACCG
541 ATATGGCCAG TGTGCCGGTC TCCGTTATCG GGGGAAGAAGT GGCTGATCTC AGCCACCGCG
601 AAAATGACAT CAAAAACGCC ATTAACCTGA TGTTCTGGGG AATATAGAAT TCGCGGCCGC
661 ACTCGAGATA TCTAGACCCA GCTTTCCTGT ACAAAGTTGG CATTATAAGA AAGCATTGCT
721 TATCAATTTG TTGCAACGAA CAGGTCACCTA TCAGTCAAAA TAAATCATT ATTTGCCATC
781 CAGCTGCAGC TCTGGCCCGT GTCTCAAAAT CTCTGATGTT ACATTGCACA AGATAAAAAAT
841 ATATCATCAT GAACAATAAA ACTGTCCTGCT TACATAAACA GTAATACAAG GGGTGTTATG
901 AGCCATATTC AACGGGAAAC GTCGAGGCCG CGATTAAATT CCAACATGGA TGCTGATTTA
961 TATGGGTATA AATGGGCTCG CGATAATGTC GGGCAATCAG GTGCGACAAT CTATCGCTTG
1021 TATGGGAAGC CCGATGCGCC AGAGTTGTTT CTGAAACATG GCAAAGGTAG CGTTGCCAAT
1081 GATGTTACAG ATGAGATGGT CAGACTAAAC TGGCTGACGG AATTTATGCC TCTTCCGACC
1141 ATCAAGCATT TTATCCGTAC TCCTGATGAT GCATGGTTAC TCACCACTGC GATCCCCGGA
1201 AAAACAGCAT TCCAGGTATT AGAAGAATAT CCTGATTCAG GTGAAAATAT TGTTGATGCG
1261 CTGGCAGTGT TCCTGCGCCG GTTGCAATTCG ATTCCTGTTT GTAATTGTCC TTTTAACAGC
1321 GATCGCGTAT TTCGTCTCGC TCAGGCGCAA TCACGAATGA ATAACGGTTT GGTGATGCG
1381 AGTGATTTTG ATGACGAGCG TAATGGCTGG CCTGTTGAAC AAGTCTGGAA AGAAATGCAT
1441 AAACCTTTGC CATTCTCACC GGATTCAGTC GTCACATCATG GTGATTTCTC ACTTGATAAC
1501 CTTATTTTTG ACGAGGGGAA ATTAATAGGT TGTATTGATG TTGGACGAGT CGGAATCGCA
1561 GACCGATACC AGGATCTTGC CATCCTATGG AACTGCCTCG GTGAGTTTTC TCCTTCATTA
1621 CAGAAACGGC TTTTTCAAAA ATATGGTATT GATAATCCTG ATATGAATAA ATTGCAGTTT
1681 CATTGATGTC TCGATGAGTT TTTCTAATCA GAATTGGTTA ATTGGTTGTA ACATTATTCA
1741 GATTGGGCCC CGTTCCACTG AGCGTCAGAC CCCGTAGAAA AGATCAAAGG ATCTTCTTGA
1801 GATCCTTTTT TTCTGCGCGT AATCTGCTGC TTGCAAACAA AAAAACCACC GCTACCAGCG
1861 GTGGTTTGTT TGCCGGATCA AGAGCTACCA ACTCTTTTTC CGAAGGTAAC TGGCTTCAGC
1921 AGAGCGCAGA TACCAAATAC TGTTCTTCTA GTGTAGCCGT AGTTAGGCCA CCACTTCAAG
1981 AACTCTGTAG CACCGCCTAC ATACCTCGCT CTGCTAATCC TGTTACCAGT GGCTGCTGCC
2041 AGTGGCGATA AGTCGTGTCT TACCGGGTTG GACTCAAGAC GATAGTTACC GGATAAGGCG
2101 CAGCGGTCGG GCTGAACGGG GGGTTCGTGC ACACAGCCCA GCTTGGAGCG AACGACCTAC
2161 ACCGAACCTGA GATACCTACA GCGTGAGCTA TGAGAAAGCG CCACGCTTCC CGAAGGGAGA
2221 AAGGCGGACA GGTATCCGGT AAGCGGCAGG GTCGGAACAG GAGAGCGCAC GAGGGAGCTT
2281 CCAGGGGGAA ACGCCTGGTA TCTTTATAGT CCTGTCGGGT TTCGCCACCT CTGACTTGAG
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2641 CGGGAGCGGA TTTGAACGTT GTGAAGCAAC GGCCCGGAGG GTGGCGGGCA GGACGCCCGC
2701 CATAAACTGC CAGGCATCAA ACTAAGCAGA AGGCCATC

```

Figure 16B

[illegible]

pENTR8 2735 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
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339..644	ccdB
673..772	attL2
895..1704	KmR
1809..2382	ori

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121 AAGCAATGCT TTTTATAAAT GCCAACTTTG TACAAAAAAG CAGGCTTTGA AAACCTGTAT
181 TTTCAAGGAA CCATGGACCT AGTCGACTGG ATCCGGTACC GAATTCGCTT ACTAAAAGCC
241 AGATAACAGT ATGCGTATTT GCGCGCTGAT TTTGCGGTA TAAGAATATA TACTGATATG
301 TATACCCGAA GTATGTCAAA AAGAGGTGTG CTTCTAGAAT GCAGTTTAAAG GTTTACACCT
361 ATAAAAGAGA GAGCCGTTAT CGTCTGTTTG TGGATGTACA GAGTGATATT ATTGACACGC
421 CCGGGCGACG GATAGTGATC CCCCTGGCCA GTGCACGTCT GCTGTCAGAT AAAGTCTCCC
481 GTGAACTTTA CCCGGTGGTG CATATCGGGG ATGAAAGCTG GCGCATGATG ACCACCGATA
541 TGGCCAGTGT GCCGGTCTCC GTTATCGGGG AAGAAGTGGC TGATCTCAGC CACCGCGAAA
601 ATGACATCAA AAACGCCATT AACCTGATGT TCTGGGGAAT ATAGAATTCTG CGGCCGCACT
661 CGAGATATCT AGACCCAGCT TTCTTGTAACA AAGTTGGCAT TATAAGAAAG CATTGCTTAT
721 CAATTTGTTG CAACGAACAG GTCACATCA GTCAAAATAA AATCATTATT TGCCATCCAG
781 CTGCAGCTCT GGCCCGTGTC TCAAAATCTC TGATGTTACA TTGCACAAGA TAAAAATATA
841 TCATCATGAA CAATAAAACT GTCTGCTTAC ATAAACAGTA ATACAAGGGG TGTTATGAGC
901 CATATTCAAC GGGAAACGTC GAGGCCGCGA TTAAATTCCA ACATGGATGC TGATTTATAT
961 GGGTATAAAT GGGCTCGCGA TAATGTCTGG CAATCAGGTG CGACAATCTA TCGCTTGTAT
1021 GGGGAAGCCG ATGCGCCAGA GTTGTTCTTG AAACATGGCA AAGGTAGCGT TGCCAATGAT
1081 GTTACAGATG AGATGGTCAG ACTAAACTGG CTGACGGAAT TTATGCCTCT TCCGACCATC
1141 AAGCATTTTA TCCGTACTCC TGATGATGCA TGGTTACTCA CCACTGCGAT CCCCAGAAAA
1201 ACAGCATTCC AGGTATTAGA AGAATATCCT GATTTCAGGTG AAAATATTGT TGATGCGCTG
1261 GCAGTGTCCT TGCGCCGGTT GCATTTCGAT CCTGTTTGTA ATTGTCCTTT TAACAGCGAT
1321 CGCGTATTTT GTCTCGCTCA GCGCAATCA CGAATGAATA ACGGTTTGGT TGATGCGAGT
1381 GATTTTGTATG ACGAGCGTAA TGGCTGGCCT GTTGAACAAG TCTGGAAAAG AATGCATAAA
1441 CTTTTGCCAT TCTCACCAGA TTCAGTCGTC ACTCATGGTG ATTTCTCACT TGATAACCTT
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1561 CGATACCAGG ATCTTGCCAT CCTATGGAAC TGCCTCGGTG AGTTTCTCTC TTCATTACAG
1621 AAACGCTTTT TTCAAAAATA TGGTATTGAT AATCCTGATA TGAATAAATT GCAGTTTCAT
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1861 GTTTGTTTGC CGGATCAAGA GCTACCAACT CTTTTTCCGA AGGTAAGTGG CTTACAGCAG
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2161 GAAGTGAGAT ACCTACAGCG TGAGCTATGA GAAAGCGCCA CGCTTCCCGA AGGGAGAAAG
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2521 AGCGAGAGTA GGGAACTGCC AGGCATCAAA TAAAACGAAA GGCTCAGTCG GAAGACTGGG
2581 CCTTTCGTTT TATCTGTTGT TTGTCGGTGA ACGCTCTCCT GAGTAGGACA AATCCGCCGG
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2701 AAAGTGCCAG GCATCAAACCT AAGCAGAAGG CCATC

```

Figure 17B

Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100
1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035	2036	2037	2038	2039	2040	2041	2042	2043	2044	2045	2046	2047	2048	2049	2050	2051	2052	2053	2054	2055	2056	2057	2058	2059	2060	2061	2062	2063	2064	2065	2066	2067	2068	2069	2070	2071	2072	2073	2074	2075	2076	2077	2078	2079	2080	2081	2082	2083	2084	2085	2086	2087	2088	2089	2090	2091	2092	2093	2094	2095	2096	2097	2098	2099	2100	

NdeI BglII SalI BamHI KpnI EcoRI
~~cat atg aga tct gtc gac tga atc cgg tac cga att cgc ---~~
~~gta tac tct aga cag cgg acc tag gcc atg gct taa gcc ---~~
 His Met Arg Ser Val Asp Trp Ile Arg Tyr Arg Ile

Death --- ^{EcoRI}aga att ^{NstI}cgc ggc cgc ^{XhoI}act cga ^{EcoRI}gat ^{XbaI}atc tag ^{att L2}acc cag
 --- tct taa gcg cgc cgc tga gct cta tag atc tgg gtc

Int
 ctt tct tgt aca aag --
 gaa aga aca tgt tcc --

pENTR9 2735 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
67..166	attL1
339..644	ccdB
673..772	attL2
895..1704	KmR
1809..2382	ori

```

1 CTGACGGATG GCCTTTTTGC GTTTCTACAA ACTCTTCCTG TTAGTTAGTT ACTTAAGCTC
61 GGGCCCCAAA TAATGATTTT ATTTTGA CTG ATAGTGACCT GTTCGTTGCA ACAAATTGAT
121 AAGCAATGCT TTTTATAAT GCCAACTTTG TACAAAAAAG CAGGCTTTGA AAACCTGTAT
181 TTTCAAGGAC ATATGAGATC TGTCGACTGG ATCCGGTACC GAATTCGCTT ACTAAAAGCC
241 AGATAACAGT ATGCGTATTT GCGCGCTGAT TTTTGC GGTA TAAGAATATA TACTGATATG
301 TATACCCGAA GTATGTCAAA AAGAGGTGTG CTTCTAGAAT GCAGTTTAAG GTTTACACCT
361 ATAAAAGAGA GAGCCGTTAT CGTCTGTTTG TGGATGTACA GAGTGATATT ATTGACACGC
421 CCGGGCGACG GATAGTGATC CCCCTGGCCA GTGCACGTCT GCTGTCAGAT AAAGTCTCCC
481 GTGAAC TTTA CCCGGTGGTG CATATCGGGG ATGAAAGCTG GCGCATGATG ACCACCGATA
541 TGGCCAGTGT GCCGGTCTCC GTTATCGGGG AAGAAAGTGGC TGATCTCAGC CACCGCGAAA
601 ATGACATCAA AAACGCCATT AACCTGATGT TCTGGGGAAT ATAGAATTCTG CGGCCGCACT
661 CGAGATATCT AGACCCAGCT TTCTTG TACA AAGTTGGCAT TATAAGAAAG CATTGCTTAT
721 CAATTTGTTG CAACGAACAG GTCAC TATCA GTCAAAATAA AATCATTATT TGCCATCCAG
781 CTGCAGCTCT GGCCCGTGTC TCAAAATCTC TGATGTTACA TTGCACAAGA TAAAAATATA
841 TCATCATGAA CAATAAAACT GTCTGCTTAC ATAAACAGTA ATACAAGGGG TGTTATGAGC
901 CATATTCAAC GGGAAACGTC GAGGCCGCGA TTAAATTCCA ACATGGATGC TGATTTATAT
961 GGGTATAAAT GGGCTCGCGA TAATGTCGGG CAATCAGGTG CGACAATCTA TCGCTTGAT
1021 GGGGAAGCCCG ATGCGCCAGA GTTGT TCTG AAACATGGCA AAGGTAGCGT TGCCAATGAT
1081 GTTACAGATG AGATGGTCAG ACTAACTGG CTGACGGAAT TTATGCCTCT TCCGACCATC
1141 AAGCATTTTA TCCGTACTCC TGATGATGCA TGGTTACTCA CCACTGCGAT CCCC GGAAAA
1201 ACAGCATTCC AGGTATTAGA AGAATATCCT GATTCAGGTG AAAATATTGT TGATGCGCTG
1261 GCAGTG TCCC TGCGCCGGTT GCATTCGATT CCTGTTTGTA ATTGTCCTTT TAACAGCGAT
1321 CGCGTATTTT GTCTCGCTCA GCGCAATCA CGAATGAATA ACGGTTTGGT TGATGCGAGT
1381 GATTTTGATG ACGAGCGTAA TGGCTGGCCT GTTGAACAAG TCTGGAAAGA AATGCATAAA
1441 CTTTTGCCAT TCTCACC GGA TTCAGTCGTC ACTCATGGTG ATTTCTCACT TGATAACCTT
1501 ATTTT TGACG AGGGGAAATT AATAGGTTGT ATTGATGTTG GACGAGTCGG AATCGCAGAC
1561 CGATACCAGG ATCTTGCCAT CCTATGGAAC TGCCTCGGTG AGTTTTCTCC TTCATTACAG
1621 AAACGGCTTT TTCAAAAATA TGGTATTGAT AATCCTGATA TGAATAAATT GCAGTTTCAT
1681 TTGATGCTCG ATGAGTTTTT CTAATCAGAA TTGGTTAATT GGTTGTAACA TTATTCAGAT
1741 TGGGCCCCGT TCCACTGAGC GTCAGACCCC GTAGAAAAGA TCAAAGGATC TTCTTGAGAT
1801 CCTTTTTTTC TGCGCGTAAT CTGCTGCTTG CAAACAAAAA AACCACCGCT ACCAGCGGTG
1861 GTTTGTTTGC CGGATCAAGA GCTACCAACT CTTTTTCCGA AGGTAAC TGG CTTCAGCAGA
1921 GCGCAGATAC CAAATACTGT TCTTCTAGTG TAGCCGTAGT TAGGCCACCA CTTCAAGAAC
1981 TCTGTAGCAC CGCTACATA CCTCGCTCTG CTAATCCTGT TACCAGTGGC TGCTGCCAGT
2041 GCGGATAAGT CGTGTCTTAC CGGGTTGGAC TCAAGACGAT AGTTACCGGA TAAGGCGCAG
2101 CGGTCGGGCT GAACGGGGGG TTCGTGCACA CAGCCCAGCT TGGAGCGAAC GACCTACACC
2161 GAACTGAGAT ACCTACAGCG TGAGCTATGA GAAAGCGCCA CGCTTCCC GA AGGGAGAAAG
2221 GCGGACAGGT ATCCGGTAAG CCGCAGGGTC GGAACAGGAG AGCGCACGAG GGAGCTTCCA
2281 GGGGGAAACG CCTGGTATCT TTATAGTCTT GTCGGGTTTC GCCACCTCTG ACTTGAGCGT
2341 CGATTTTGTG GATGCTCGTC AGGGGGGCGG AGCCTATGGA AAAACGCCAG CAACGCGGCC
2401 TTTTACGGT TCCTGGCCTT TTGCTGGCCT TTTGCTCACA TGTTCTTTCC TGCGTTATCC
2461 CCTGATTCTG TGGATAACCG TATTACCGCT AGCATGGATC TCGGGGACGT CTAAC TACTA
2521 AGCGAGAGTA GGGAACTGCC AGGCATCAAA TAAAACGAAA GGCTCAGTCG GAAGACTGGG
2581 CCTTTCGTTT TATCTGTTGT TTGTCGGTGA ACGCTCTCCT GAGTAGGACA AATCCGCCGG
2641 GAGCGGATTT GAACGTTGTG AAGCAACGGC CCGGAGGGTG GCGGGCAGGA CGCCCGCCAT
2701 AAAC TGCCAG GCATCAA ACT AAGCAGAAGG CCATC

```

FIGURE 18B

Figure 19A: Cloning sites of the ENTRY Vector pENTR10

Int attL1 S.D. -12 Nde

--- ~~ctg~~ tac aaa aaa gca ggc ttc gaa cta agg aaa tac tta cat
 --- ~~aac~~ ~~atg~~ ~~ctt~~ ttt cgt ccg ~~agg~~ ctt gat tcc ttt atg aat gta
 Leu Tyr Lys Lys Ala Gly Phe Glu Leu Arg Lys Tyr Leu His

K3 Xba Sal Bam Kpn EcoRI

atg gga ~~acc~~ aat tca gtc gac tgg atc cgg tac cga att cgc ---
 tac cct tgg tta agt cag ctg acc tag gcf atg gct taa gcg ---
 Met Gly Thr Asn Ser Val Asp Trp Ile Arg Tyr Arg Ile

EcoRI Not Xho EcoRII Xba attL2

Death --- aga att cgc ~~ggc~~ cgc act cga gat ~~atc~~ tag ~~acc~~ cag
 (ccdB) --- tct taa ~~gcg~~ ccg ~~gcg~~ tga gct ~~cta~~ tag ~~atc~~ tgg gtc

Int

ctt ~~tcg~~ ~~agg~~ ~~aca~~ ~~aag~~ ---
 gaa aga aca ~~tgt~~ ~~tgc~~ ---

003050 0047550

pENTR10 2738 bp

Location (Base Nos.)	Gene Encoded
67..166	attL1
342..647	ccdB
676..775	attL2
898..1707	KmR
1812..2385	ori

```

1 CTGACGGATG GCCTTTTTGC GTTTCTACAA ACTCTTCCTG TTAGTTAGTT ACTTAAGCTC
61 GGGCCCCAAA TAATGATTTT ATTTTACTG ATAGTGACCT GTTCGTTGCA ACAAATTGAT
121 AAGCAATGCT TTTTATAAT GCCAACTTTG TACAAAAAAG CAGGCTTCGA ACTAAGGAAA
181 TACTTACATA TGGGAACCAA TTCAGTCGAC TGGATCCGGT ACCGAAATCG CTTACTAAAA
241 GCCAGATAAC AGTATGCGTA TTTGCGCGCT GATTTTTCG GTATAAGAAAT ATATACTGAT
301 ATGTATAACCC GAAGTATGTC AAAAAGAGGT GTGCTTCTAG AATGCAGTTT AAGGTTTACA
361 CCTATAAAAG AGAGAGCCGT TATCGTCTGT TTGTGGATGT ACAGAGTGAT ATTATTGACA
421 CGCCCGGGCG ACGGATGGTG ATCCCCCTGG CCAGTGACAG TCTGCTGTCA GATAAAGTCT
481 CCCGTGAACT TTACCCGGTG GTGCATATCG GGGATGAAAG CTGGCGCATG ATGACCACCG
541 ATATGGCCAG TGTGCCGGTC TCCGTTATCG GGGAGAAGT GGCTGATCTC AGCCACCGCG
601 AAAATGACAT CAAAAACGCC ATTAACCTGA TGTTCTGGGG AATATAGAAT TCGCGGCCGC
661 ACTCGAGATA TCTAGACCCA GCTTTCCTGT ACAAAGTTGG CATTATAAGA AAGCATTGCT
721 TATCAATTTG TTGCAACGAA CAGGTCACCTA TCAGTCAAAA TAAAAATCATT ATTTGCCATC
781 CAGCTGCAGC TCTGGCCCGT GTCTCAAAAT CTCTGATGTT ACATTGCACA AGATAAAAAT
841 ATATCATCAT GAACAATAAA ACTGTCTGCT TACATAAACA GTAATACAAG GGGTGTATG
901 AGCCATATTC AACGGGAAAC GTCGAGGCCG CGATTAAAT CCAACATGGA TGCTGATTTA
961 TATGGGTATA AATGGGCTCG CGATAATGTC GGGCAATCAG GTGCGACAAT CTATCGCTTG
1021 TATGGGAAGC CCGATGCGCC AGAGTTGTTT TCGAAACATG GCAAAGGTAG CGTTGCCAAT
1081 GATGTTACAG ATGAGATGGT CAGACTAAAC GTGCTGACGG AATTTATGCC TCTTCCGACC
1141 ATCAAGCATT TTATCCGTAC TCCTGATGAT GCATGGTTAC TCACCACTGC GATCCCCGGA
1201 AAAACAGCAT TCCAGGTATT AGAAGAATAT CCTGATTCAG GTGAAAATAT TGTTGATGCG
1261 CTGGCAGTGT TCCTGCGCCG GTTGCAATCG ATTCCTGTTT GTAATTGTCC TTTTAACAGC
1321 GATCGCGTAT TTCGTCTCGC TCAGGCGCAA TCACGAATGA ATAACGGTTT GGTGATGCG
1381 AGTGATTTTG ATGACGAGCG TAATGGCTGG CCTGTTGAAC AAGTCTGGAA AGAAATGCAT
1441 AAACTTTTGC CATTCTCACC GGATTCAGTC GTCACCTCAT GTGATTTCTC ACTTGATAAC
1501 CTTATTTTTG ACGAGGGGAA ATTAATAGGT TGTATTGATG TTGACGAGT CGGAATCGCA
1561 GACCGATACC AGGATCTTGC CATCCTATGG AACTGCCTCG GTGAGTTTTC TCCTTCATTA
1621 CAGAAACGGC TTTTTCAAAA ATATGGTATT GATAATCCTG ATATGAATAA ATTGCAGTTT
1681 CATTGTATGC TCGATGAGTT TTTCTAATCA GAATTGGTTA ATTGGTTGTA ACATTATTCA
1741 GATTGGGCCC CGTTCCACTG AGCGTCAGAC CCCGTAGAAA AGATCAAAGG ATCTTCTTGA
1801 GATCCTTTTT TTCTGCGCGT AATCTGCTGC TTGCAAACAA AAAAACCACC GCTACCAGCG
1861 GTGTTTGTG TTGCCGATCA AGAGCTACCA ACTCTTTTTC CGAAGGTAAC TGGCTTCAGC
1921 AGAGCGCAGA TACCAAATAC TGTTCTTCTA GTGTAGCCGT AGTTAGGCCA CCACTTCAAG
1981 AACTCTGTAG CACCGCCTAC ATACCTCGCT CTGCTAATCC TGTTACCAGT GGCTGCTGCC
2041 AGTGGCGATA AGTCGTGTCT TACCGGGTTG GACTCAAGAC GATAGTTACC GGATAAGGCG
2101 CAGCGGTCGG GCTGAACGGG GGGTTCGTGC ACACAGCCCA GCTTGAGCG AACGACCTAC
2161 ACCGAACCTGA GATACCTACA GCGTGAGCTA TGAGAAAGCG CCACGCTTCC CGAAGGGAGA
2221 AAGGCGGACA GGTATCCGGT AAGCGGCAGG GTCGGAACAG GAGAGCGCAC GAGGGAGCTT
2281 CCAGGGGGAA ACGCCTGGTA TCTTTATAGT CCTGTCGGGT TTCGCCACCT CTGACTTGAG
2341 CGTCGATTTT TGTGATGCTC GTCAGGGGGG CGGAGCCTAT GGAAAAACGC CAGCAACGCG
2401 GCCTTTTTAC GGTTCCTGGC CTTTGTCTGG CCTTTTGTCT ACATGTTCTT TCCTGCGTTA
2461 TCCCCTGATT CTGTGGATAA CCGTATTACC GCTAGCATGG ATCTCGGGGA CGTCTAATAA
2521 CTAAGCGAGA GTAGGGAACCT GCCAGGCATC GAATAAAACG AAAGGCTCAG TCGGAAGACT
2581 GGGCCTTTTCG TTTTATCTGT TGTTTGTCTG TGAACGCTCT CCTGAGTAGG ACAAATCCGC
2641 CGGGAGCGGA TTTGAACGTT GTGAAGCAAC GGCCCGGAGG GTGGCGGGCA GGACGCCCCG
2701 CATAAACTGC CAGGCATCAA ACTAAGCAGA AGGCCATC

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FIGURE 19B

Figure 20A: Cloning Sites of the Entry Vector pENTR11

Int	attL1				S.D.				Kozak XmnI				S.D.				
TTG	TAC	AAA	AAA	GCA	GGC	TTC	GAA	GGA	GAT	AGA	ACC	AAT	TCT	CTA	AGG	AAA	TAC
AAC	ATG	TTT	TTT	CGT	CCG	AAG	CTT	CCT	CTA	TCT	TGG	TTA	AGA	GAT	TCC	TTT	ATG
<div style="display: flex; justify-content: space-around; margin-top: 10px;"> LeuTyrLysLysAlaGlyPheGluGlyAspArgThrAsnSerLeuArgLysTyr </div>																	

Kozak		NcoI	Sali	BamHI		KpnI		EcoRI				EcoRI	NotI				
TTA	ACC	ATG	GTC	GAC	TGG	ATC	CGG	TAC	CGA	ATT	C--	ccdB	--G	AAT	TCG	CGG	CCG
AAT	TGG	TAC	CAG	CTG	ACC	TAG	GCC	ATG	GCT	TAA	G		C	TTA	AGC	GCC	GGC
<div style="display: flex; justify-content: space-around; margin-top: 10px;"> LeuThrMetValAspTrpIleArgTyrArgIle AsnSerArgPro </div>																	

XhoI	EcoRV				XbaI	Int				attL2			
CAC	TCG	AGA	TAT	CTA	GAC	CCA	GCT	TTC	TTG	TAC	AAA	G	
GTG	AGC	TCT	ATA	GAT	CTG	GGT	CGA	AAG	AAC	ATG	TTT	C	
<div style="display: flex; justify-content: space-around; margin-top: 10px;"> HisSerArgTyrLeuAspProAlaPheLeuTyrLys </div>													

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pENTR11 2744 bp (rotated to position 2578)

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
67..166	attL1
348..653	ccdB
683..781	attL2
904..1713	KmR
1818..2391	ori

```

1 CTGACGGATG GCCTTTTTGC GTTTCTACAA ACTCTTCCTG TTAGTTAGTT ACTTAAGCTC
61 GGGCCCCAAA TAATGATTTT ATTTTGACTG ATAGTGACCT GTTCGTTGCA ACAAATTGAT
121 AAGCAATGCT TTTTATAAT GCCAACTTTG TACAAAAAAG CAGGCTTCGA AGGAGATAGA
181 ACCAATTCTC TAAGGAAATA CTTAACCATG GTCGACTGGA TCCGGTACCG AATTCGCTTA
241 CTAAAAGCCA GATAACAGTA TGCGTATTTG CGCGCTGATT TTTGCGGTAT AAGAATATAT
301 ACTGATATGT ATACCCGAAG TATGTCAAAA AGAGGTGTGC TTCTAGAATG CAGTTTAAGG
361 TTTACACCTA TAAAAGAGAG AGCCGTATAT GTCTGTTTGT GGATGTACAG AGTGATATTA
421 TTGACACGCC CGGGCGACGG ATAGTGATCC CCCTGGCCAG TGCACGTCTG CTGTCAGATA
481 AAGTCTCCCG TGAACTTTAC CCGGTGGTGC ATATCGGGGA TGAAAGCTGG CGCATGATGA
541 CCACCGATAT GGCCAGTGTG CCGTCTCCG TTATCGGGGA AGAAGTGGCT GATCTCAGCC
601 ACCCGGAAAA TGACATCAAA AACGCCATTA ACCTGATGTT CTGGGGAATA TAGAATTCGC
661 GGCCGCACTC GAGATATCTA GACCCAGCTT TCTTGTAACA AGTTGGCATT ATAAGAAAGC
721 ATTGCTTATC AATTTGTTGC AACGAACAGG TCACTATCAG TCAAAATAAA ATCATTATTT
781 GCCATCCAGC TGCAGCTCTG GCGCGTGTCT CAAAATCTCT GATGTTACAT TGCACAAGAT
841 AAAAATATAT CATCATGAAC AATAAAACTG TCTGCTTACA TAAACAGTAA TACAAGGGGT
901 GTTATGAGCC ATATTCAACG GGAAACGTCG AGGCCGCGAT TAAATTCCAA CATGGATGCT
961 GATTTATATG GGTATAAATG GGCTCGCGAT AATGTCGGGC AATCAGGTGC GACAATCTAT
1021 CGCTTGATG GGAAGCCCGA TGCGCCAGAG TTGTTTCTGA AACATGGCAA AGGTAGCGTT
1081 GCCAATGATG TTACAGATGA GATGGTCAGA CTAAACTGGC TGACGGAATT TATGCCTCTT
1141 CCGACCATCA AGCATTTTAT CCGTACTCCT GATGATGCAT GGTTACTCAC CACTGCGATC
1201 CCCGAAAAAA CAGCATTCCA GGTATTAGAA GAATATCCTG ATTCAGGTGA AAATATTGTT
1261 GATGCGCTGG CAGTGTTTCT TCTCGCTCAG GCGCAATCAC GAATGAATAA CGGTTTGTTT
1321 AACAGCGATC CGGTATTTTC TCTCGCTCAG GCGCAATCAC GAATGAATAA CGGTTTGTTT
1381 GATGCGAGTG ATTTTGATGA CGAGCGTAAT GGCTGGCCTG TTGAACAAGT CTGGAAAGAA
1441 ATGCATAAAC TTTTGCCATT CTCACCGGAT TCAGTCGTCA CTCATGGTGA TTTCTCACTT
1501 GATAACCTTA TTTTGGACGA GGGGAAATTA ATAGTTGTA TTGATGTTGG ACGAGTCGGA
1561 ATCGCAGACC GATACCAGGA TCTTGCCATC CTATGGAAC GCCTCGGTGA GTTTTCTCCT
1621 TCATTACAGA AACGGCTTTT TCAAAAATAT GGTATTGATA ATCCTGATAT GAATAAATTG
1681 CAGTTTCATT TGATGCTCGA TGAGTTTTTC TAATCAGAAT TGGTTAATTG GTTGTAACAT
1741 TATTCAGATT GGGCCCCGTT CCACTGAGCG TCAGACCCCG TAGAAAAGAT CAAAGGATCT
1801 TCTTGAGATC CTTTTTTTCT GCGCGTAATC TGCTGCTTGC AAACAAAAAA ACCACCGCTA
1861 CCAGCGGTGG TTTGTTTGCC GGATCAAGAG CTACCAACTC TTTTCCGAA GGTAACGGC
1921 TTCAGCAGAG CGCAGATACC AAATACTGTT CTCTAGTGT AGCCGTAGTT AGGCCACCAC
1981 TTCAAGAACT CTGTAGCACC GCCTACATAC CTCGCTCTGC TAATCCTGTT ACCAGTGGCT
2041 GCTGCCAGTG GCGATAAGTC GTGTCTTACC GGGTTGGACT CAAGACGATA GTTACCGGAT
2101 AAGGCGCAGC GGTCTGGGCTG AACGGGGGGT TCGTGCACAC AGCCCAGCTT GGAGCGAACG
2161 ACCTACACCG AACTGAGATA CCTACAGCGT GAGCTATGAG AAAGCGCCAC GCTTCCCGAA
2221 GGGAGAAAGG CGGACAGGTA TCCGGTAAGC GGCAGGGTCG GAACAGGAGA GCGCACGAGG
2281 GAGCTTCCAG GGGGAAACGC CTGGTATCTT TATAGTCCTG TCGGGTTTCG CCACCTCTGA
2341 CTTGAGCGTC GATTTTTGTG ATGCTCGTCA GGGGGGCGGA GCCTATGGAA AAACGCCAGC
2401 AACGCGGCCT TTTTACGGTT CCTGGCCTTT TGCTGGCCTT TTGCTCACAT GTTCTTTCTT
2461 GCGTTATCCC CTGATTCTGT GGATAACCGT ATTACCGCTA GCATGGATCT CGGGGACGTC
2521 TAACTACTAA GCGAGAGTAG GGAAGTCCA GGCATCAAAT AAAACGAAAG GCTCAGTCGG
2581 AAGACTGGGC CTTTCGTTTT ATCTGTTGTT TGTCGGTGAA CGCTCTCCTG AGTAGGACAA
2641 ATCCGCCGGG AGCGGATTTG AACGTTGTGA AGCAACGGCC CGGAGGGTGG CGGGCAGGAC
2701 GCCCCCATA AACTGCCAGG CATCAAATA AGCAGAAGGC CATC

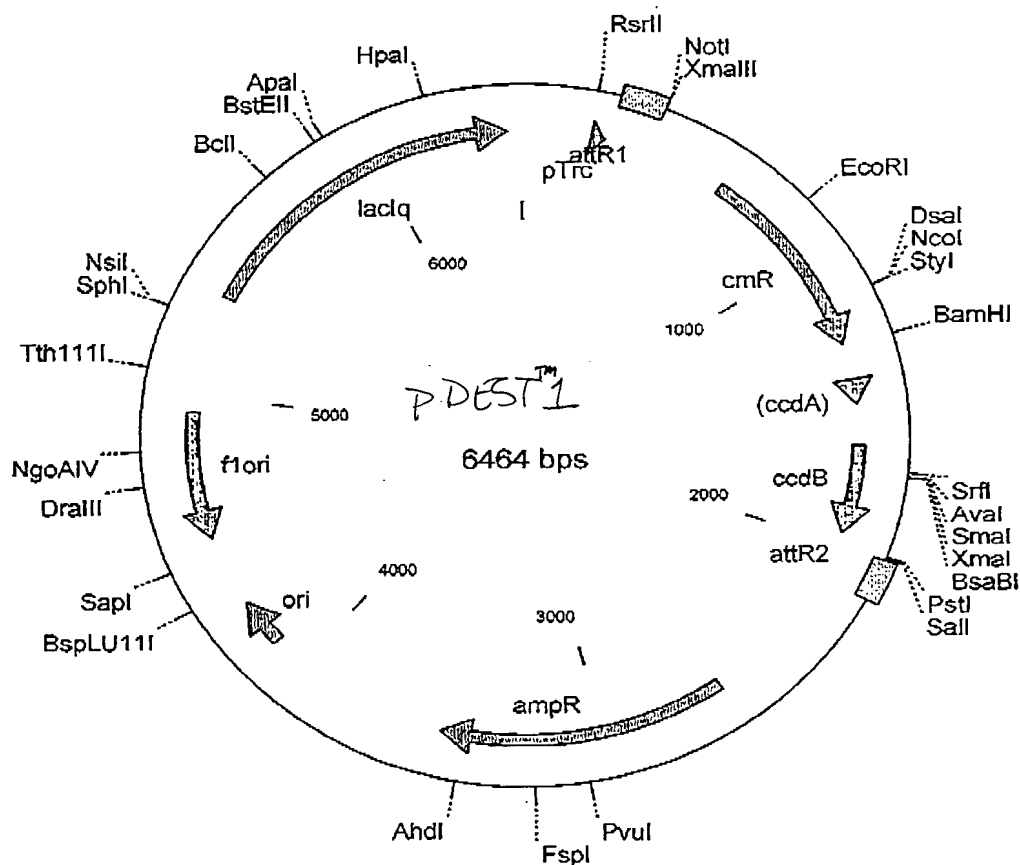
```

FIGURE 20B

Figure 2/A: *pDEST1*

Native Protein Expression in *E. coli*

1 atgagctg⁻³⁵ gac^{Tac promoter}attaat catccggctc g⁻¹⁰ataatgtg tggattgtg agcggataac
 tactcgacaa ctgtaatta gtaggccgag catattacac accttaacac tcgcctattg
 61 aatttcacac aggaaacaga caggtatagg atcacaagtt ^{Int attR1} ~~tgtacdaada agctgaacga~~
 ttaaagtgtg tcctttgtct gtccatatcc tagtgttcaa acatg~~ttt~~tc ~~tcgactt~~gct



09317430 030200

pDEST1 6464 bp

Location (Base Nos.)	Gene Encoded
216..257	Trc promoter
397..273	attR1
647..1306	CmR
1426..1510	inactivated ccdA
1648..1953	ccdB
1994..2118	attR2
2598..3503	ampR
4104..4264	ori
4504..4941	flori (f1 intergenic region)
5340..6420	lacIq

```

1 GTTTGACAGC TTATCATCGA CTGCACGGTG CACCAATGCT TCTGGCGTCA GGCAGCCATC
61 GGAAGCTGTG GTATGGCTGT GCAGGTCGTA AATCACTGCA TAATTCGTGT CGCTCAAGGC
121 GCACTCCCGT TCTGGATAAT GTTTTTTGCG CCGACATCAT AACGGTTCTG GCAAATATTC
181 TGAAATGAGC TGTTGACAAT TAATCATCCG GTCCGTATAA TCTGTGGAAT TGTGAGCGGG
241 ATAACAATTT CATCGCGAGG TACCAAGCTA TCACAAGTTT GTACAAAAAA GCTGAACGAG
301 AAACGTAAAA TGATATAAAT ATCAATATAT TAAATTAGAT TTTGCATAAA AAACAGACTA
361 CATAATACTG TAAAACACAA CATATCCAGT CACTATGGCG GCCGCTAAGT TGGCAGCATC
421 ACCCGACGCA CTTTGCGCCG AATAAATACC TGTGACGGAA GATCACTTCG CAGAATAAAT
481 AAATCCTGGT GTCCCTGTTG ATACCGGGAA GCCCTGGGCC AACTTTTGCG GAAAATGAGA
541 CGTTGATCGG CACGTAAGAG GTTCCAAC TTACCATAAT GAAATAAGAT CACTACCGGG
601 CGTATTTTTT GAGTTATCGA GATTTTCAGG AGCTAAGGAA GCTAAAATGG AGAAAAAAT
661 CACTGGATAT ACCACCGTTG ATATATCCCA ATGGCATCGT AAAGAACATT TTGAGGCATT
721 TCAGTCAGTT GCTCAATGTA CCTATAACCA GACCGTTCAG CTGGATATTA CGGCCTTTTT
781 AAAGACCGTA AAGAAAAATA AGCACAAGTT TTATCCGGCC TTTATTACCA TTCTTGCCCC
841 CCTGATGAAT GCTCATCCGG AATTCCGTAT GGCAATGAAA GACGGTGAGC TGGTGATATG
901 GGATAGTGTT CACCCTTGTT ACACCGTTTT CCATGAGCAA ACTGAAACGT TTTCATCGCT
961 CTGGAGTGAA TACCACGACG ATTTCCGGCA GTTTCTACAC ATATATTTCG AAGATGTGGC
1021 GTGTTACGGT GAAAACCTGG CCTATTTCCC TAAAGGGTTT ATTGAGAATA TGTTTTTTCGT
1081 CTCAGCCAAT CCCTGGGTGA GTTTCACCAG TTTTGATTTA AACGTGGCCA ATATGGACAA
1141 CTTCTTCGCC CCCGTTTTCA CCATGGGCAA ATATTATACG CAAGGCGACA AGGTGCTGAT
1201 GCCGCTGGCG ATTCAGGTTT ATCATGCCGT CTGTGATGGC TTCCATGTCT GCAGAATGCT
1261 TAATGAATTA CAACAGTACT GCGATGAGTG GCAGGGCGGG GCGTAAACGC GTGGATCCGG
1321 CTTACTAAAA GCCAGATAAC AGTATGCGTA TTTGCGCGCT GATTTTTCG GTATAAGAAT
1381 ATATACTGAT ATGTATACCC GAAGTATGTC AAAAAGAGGT GTGCTATGAA GCAGCGTATT
1441 ACAGTGACAG TTGACAGCGA CAGCTATCAG TTGCTCAAGG CATATATGAT TCAATATCT
1501 CCGGTCTGGT AAGCACAACC ATGCAGAATG AAGCCCGTCG TCTGCGTGCC GAACGCTGGA
1561 AAGCGGAAAA TCAGGAAGGG ATGGCTGAGG TCGCCCGGTT TATTGAAATG AACGGCTCTT
1621 TTGCTGACGA GAACAGGGAC TGGTGAAATG CAGTTTAAGG TTTACACCTA TAAAAGAGAG
1681 AGCCGTTATC GTCTGTTTGT GGATGTACAG AGTGATATTA TTGACACGCC CGGGCGACGG
1741 ATGGTGATCC CCCTGGCCAG TGCACGCTCT CTGTCTAGATA AAGTCTCCCG TGAACCTTAC
1801 CCGGTGGTGC ATATCGGGGA TGAAAGCTGG CGCATGATGA CCACCGATAT GGCCAGTGTG
1861 CCGGTCTCCG TTATCGGGGA AGAAGTGGCT GATCTCAGCC ACCGCGAAAA TGACATCAAA
1921 AACGCCATTA ACCTGATGTT CTGGGGAATA TAAATGTCAG GCTCCCTTAT ACACAGCCAG
1981 TCTGCAGGTC GACCATAGTG ACTGGATATG TTGTGTTTTA CAGTATTATG TAGTCTGTTT
2041 TTTATGCAAA ATCTAATTTA ATATATTGAT ATTTATATCA TTTTACGTTT CTCGTTTCAGC
2101 TTTCTTGTAC AAAGTGGTGA TAGCTTGGCT GTTTTGCGCG ATGAGAGAAG ATTTTCAGCC
2161 TGATACAGAT TAAATCAGAA CGCAGAAGCG GTCTGATAAA ACAGAATTG CCTGGCGGCA
2221 GTAGCGCGGT GGTCCCACCT GACCCCATGC CGAACTCAGA AGTGAAACGC CGTAGCGCCG
2281 ATGGTAGTGT GGGGTCTCCC CATGCGAGAG TAGGGAAC TGTTATCTGTT GTTTGTCGGT GAACGCTCTC
2341 AAGGCTCAGT CGAAAGACTG GGCCTTTCGT TTTATCTGTT GTTTGTCGGT GAACGCTCTC
2401 CTGAGTAGGA CAAATCCGCC GGGAGCGGAT TTGAACGTTG CGAAGCAACG GCGCGGAGGG
2461 TGGCGGGCAG GACGCCGCC ATAACTGCC AGGCATCAAA TTAAGCAGAA GGCCATCTCTG
2521 ACGGATGGCC TTTTTCGTT TCTACAACT CTTTTTGTTT ATTTTCTAA ATACATTCAA-

```

FIGURE 21B

2581 ATATGTATCC GCTCATGAGA CAATAACCCT GATAAATGCT TCAATAATAT TGAAAAAGGA
2641 AGAGTATGAG TATTCAACAT TTCCGTGTCT CCCTTATTCC CTTTTTTTGC GCATTTTGGC
2701 TTCTGTTTTT TGCTCACCCA GAAACGCTGG TGAAAGTAAA AGATGCTGAA GATCAGTTGG
2761 GTGCACGAGT GGGTTACATC GAACTGGATC TCAACAGCGG TAAGATCCTT GAGAGTTTTT
2821 GCCCCGAAGA ACGTTTTCCA ATGATGAGCA CTTTTAAAGT TCTGCTATGT GGCGCGGTAT
2881 TATCCCGTGT TGACGCCGGG CAAGAGCAAC TCGGTGCGCG CATACACTAT TCTCAGAATG
2941 ACTTGTTGA GTACTACCA GTCACAGAAA AGCATCTTAC GGATGGCATG ACAGTAAGAG
3001 AATTATGCAG TGCTGCCATA ACCATGAGTG ATAACACTGC GGCCAACCTA CTCTGACAA
3061 CGATCGGAGG ACCGAAGGAG CTAACCGCTT TTTTGACAAA CATGGGGGAT CATGTAACCTC
3121 GCCTTGATCG TTGGGAACCG GAGCTGAATG AAGCCATACC AAACGACGAG CGTGACACCA
3181 CGATGCCTAC AGCAATGGCA ACAACGTTGC GCAAACCTATT AACTGGCGAA CTACTTACTC
3241 TAGCTTCCCG GCAACAATTA ATAGACTGGA TGGAGGCGGA TAAAGTTGCA GGACCACTTC
3301 TGCCTCGGC CTTCCGGCT GGCTGGTTTA TTGCTGATAA ATCTGGAGCC GGTGAGCGTG
3361 GGTCTCGCGG TATCATTGCA GCACTGGGGC CAGATGGTAA GCCCTCCCGT ATCGTAGTTA
3421 TCTACACGAC GGGGAGTCAG GCAACTATGG ATGAACGAAA TAGACAGATC GCTGAGATAG
3481 GTGCCTCACT GATTAAGCAT TGGTAACTGT CAGACCAAGT TTACTCATAT ATACTTTAGA
3541 TTGATTTAAA ACTTCATTTT TAATTTAAAA GGATCTAGGT GAAGATCCTT TTTGATAATC
3601 TCATGACCAA AATCCCTTAA CGTGAGTTTT CGTTCCACTG AGCGTCAGAC CCCGTAGAAA
3661 AGATCAAAGG ATCTTCTTGA GATCCTTTTT TTCTGCGCGT AATCTGCTGC TTGCAAACAA
3721 AAAAACCACC GCTACCAGCG GTGGTTTGTT TGCCGGATCA AGAGCTACCA ACTCTTTTTT
3781 CGAAGGTAAC TGGCTTCAGC AGAGCGCAGA TACCAAATAC TGTCTTCTA GTGTAGCCGT
3841 AGTTAGGCCA CCACTTCAAG AACTCTGTAG CACCGCCTAC ATACCTCGCT CTGCTAATCC
3901 TGTTACCAGT GGCTGCTGCC AGTGGCGATA AGTCTGTCT TACCGGGTTG TACCTAAGAC
3961 GATAGTTACC GGATAAGGCG CAGCGGTCCG GCTGAACGGG GGGTTCGTGC ACACAGCCCA
4021 GCTTGAGCG AACGACCTAC ACCGAACTGA GATACCTACA GCGTGAGCTA TGAGAAAGCG
4081 CCACGCTTCC CGAAGGGAGA AAGGCGGACA GGTATCCGGT AAGCGGCAGG GTCGGAACAG
4141 GAGAGCGCAC GAGGGAGCTT CCAGGGGGA ACGCCTGGTA TCTTTATAGT CCTGTGCGGT
4201 TTCGCCACCT CTGACTTGAG CGTCGATTTT TGTGATGCTC GTCAGGGGGG CGGAGCCTAT
4261 GGAAAAACGC CAGCAACGCG GCCTTTTTTAC GGTTCTTGGC CTTTTGCTGG CTTTTTGCTC
4321 ACATGTTCTT TCCTGCGTTA TCCCCTGATT CTGTGGATAA CCGTATTACC GCCTTTGAGT
4381 GAGCTGATAC CGCTCGCCGC AGCCGAACGA CCGAGCGCAG CGAGTCAGTG AGCGAGGAAG
4441 CGGAAGAGCG CCTGATGCGG TATTTTCTCC TTACGCATCT GTGCGGTATT TCACACCGCA
4501 TAATTTTGTT AAAATTGCGG TTAAATTTTT GTTAAATCAG CTCATTTTTT AACCAATAGG
4561 CCGAAATCGG CAAAATCCCT TATAAATCAA AAGAATAGAC CGAGATAGGG TTGAGTGTTG
4621 TTCCAGTTTG GAACAAGAGT CCACTATTAA AGAACGTGGA CTCCAACGTC AAAGGGCGAA
4681 AAACCGTCTA TCAGGGCGAT GGCCCACTAC GTGAACCATC ACCCTAATCA AGTTTTTTTG
4741 GGTGAGGTG CCGTAAAGCA CTAAATCGGA ACCCTAAAGG GAGCCCCGA TTTAGAGCTT
4801 GACGGGGAAA GCCGGCGAAC GTGGCGAGAA AGGAAGGGAA GAAAGCGAAA GGAGCGGGCG
4861 CTAGGCGCT GCGAAGTGTA GCGGTCACGC TGCGCGTAAC CACCACACC CGCGCGCTTA
4921 ATGCGCGCT ACAGGGCGCG TCCATTGCGC ATTCAGGCTG CTATGGTGCA CTCTCAGTAC
4981 AATCTGCTCT GATGCCGAT AGTTAAGCCA GTACCAGTCA CGTAGCGATA TCGGAGTGTA
5041 TACACTCCGC TATCGCTACG TGAAGGGTGC ATGGCTGCGC CCCGACACC GCCAACACC
5101 GCTGACGCGC CTGACGGGC TTGTCTGCTC CCGGCATCCG CTTACAGACA AGCTGTGACC
5161 GTCTCCGGA GCTGCATGTG TCAGAGGTTT TCACCGTCAT CACCGAAACG CGCGAGGCAG
5221 CAGATCAATT CGCGCGCGAA GCGGAAGCGG CATGCATTTA CGTTGACACC ATCGAATGGT
5281 GCAAAACCTT TCGCGGTATG GCATGATAGC GCCCGGAAGA GAGTCAATTC AGGGTGGTGA
5341 ATGTGAAACC AGTAACGTTA TACGATGTCG CAGAGTATGC CGGTGTCTCT TATCAGACCG
5401 TTTCCCGCGT GGTGAACCAG GCCAGCCACG TTTCTGCGAA AACGCGGGAA AAAGTGAAG
5461 CGGCGATGGC GGAGCTGAAT TACATTCCCA ACCGCGTGGC ACAACAACCTG GCGGGCAAAC
5521 AGTCGTTGCT GATTGGCGTT GCCACCTCCA GTCTGGCCCT GCACGCGCCG TCGCAAATTG
5581 TCGCGGCGAT TAAATCTCGC GCCGATCAAC TGGGTGCCAG CGTGGTGGTG TCGATGGTAG
5641 AACGAAGCGG CGTCGAAGCC TGTAAGCGCG CCGTGACAAA TCTTCTCGCG CAACGCGTCA
5701 GTGGCTGAT CATTAACAT CCGCTGGATG ACCAGGATGC CATTGCTGTG GAAGTGCCT
5761 GCACTAATGT TCCGGCGTTA TTTCTTGATG TCTCTGACCA GACACCCATC AACAGTATTA
5821 TTTTCTCCCA TGAAGACGGT ACGCGACTGG GCGTGGAGCA TCTGGTCGCA TTGGGTCAAC
5881 AGCAAATCGC GCTGTTAGCG GGCCCATTA GTTCTGTCTC GGCGCGTCTG CGTCTGGCTG
5941 GCTGGCATAA ATATCTCACT CGCAATCAAA TTCAGCCGAT AGCGGAACGG GAAGGCGACT
6001 GGAGTGCCAT GTCCGGTTTT CAACAAACCA TGCAAATGCT GAATGAGGGC ATCGTTCCCA-

Figure 21C

6061	CTGCGATGCT	GGTTGCCAAC	GATCAGATGG	CGCTGGGCGC	AATGCGCGCC	ATTACCGAGT
6121	CCGGGCTGCG	CGTTGGTGCG	GATATCTCGG	TAGTGGGATA	CGACGATACC	GAAGACAGCT
6181	CATGTTATAT	CCCGCCGTTA	ACCACCATCA	AACAGGATTT	TCGCCTGCTG	GGGCAAACCA
6241	GCGTGGACCG	CTTGCTGCAA	CTCTCTCAGG	GCCAGGCGGT	GAAGGGCAAT	CAGCTGTTGC
6301	CCGTCTCACT	GGTGAAAAGA	AAAACCACCC	TGGCACCCAA	TACGCAAACC	GCCTCTCCCC
6361	GCGCGTTGGC	CGATTCATTA	ATGCAGCTGG	CACGACAGGT	TTCCCGACTG	GAAAGCGGGC
6421	AGTGAGCGCA	ACGCAATTAA	TGTGAGTTAG	CGCGAATTGA	TCTG	

CGCGAATTGA

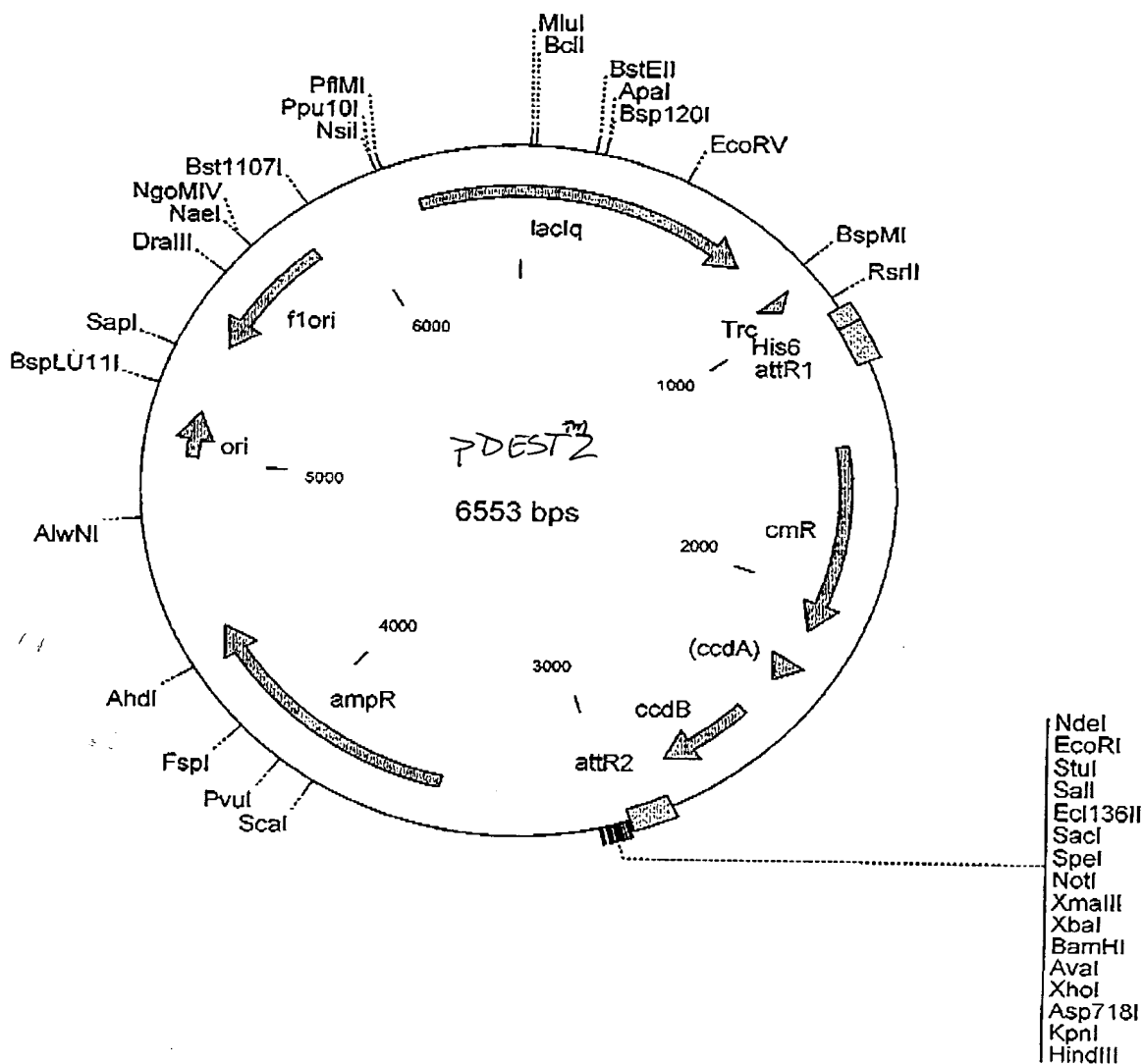
FIGURE 21D

Figure 22A: ρ DEST2

His6 fusions in E. coli

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970  aat att ctg aaa tga gct gtt gac aat taa tca tcc ggt ccg tat aat ctg
    tta taa gac ttt act cga caa ctg tta att agt agg cca ggc ata tta gac
1021  tgg aat tgt gag cgg ata aca att tca cac agg aaa cag acc atg tcg tdc
    acc tta aca ctc gcc tat tgt taa agt gtg tcc ttt gtc tgg tac agc atg
1072  Tyr His His His His His His Gln Ile Thr Ser Thr attR1
    tac cat cac cat cac cat cac ggt atc aca agt tgg tac aaa aaa gct gaa
    atg gta gtg gta gtg gta gtg ccg tag tgt tca aac atg ttt ctt cga cgt
  
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pDEST2 6553 bp

Location (Base Nos.)	Gene Encoded
912..962	Trc
1223..1009	attR1
1473..2132	CmR
2252..2336	inactivated ccdA
2474..2779	ccdB
2820..2944	attR2
3509..4414	ampR
5015..5175	ori
5415..5852	flori (f1 intergenic region)
6225..752	lacIq

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1  GGCGGTGCAC AATCTTCTCG CGCAACGCGT CAGTGGGCTG ATCATTAAC TATCCGCTGGA
61  TGACCAGGAT GCCATTGCTG TGGAAGCTGC CTGCACTAAT GTTCCGGCGT TATTTCTTGA
121 TGTCTCTGAC CAGACACCCA TCAACAGTAT TATTTTCTCC CATGAAGACG GTACGCGACT
181 GGGCGTGGAG CATCTGGTCTG CATTGGGTCA CCAGCAAATC GCGCTGTTAG CGGGCCCCATT
241 AAGTTCTGTC TCGGCGCGTC TGCGTCTGGC TGGCTGGCAT AAATATCTCA CTCGCAATCA
301 AATTCAGCCG ATAGCGGAAC GGGGAAGGCGA CTGGAGTGCC ATGTCCGGTT TTCAACAAAC
361 CATGCAAATG CTGAATGAGG GCATCGTTCC CACTGCGATG CTGGTTGCCA ACGATCAGAT
421 GGCGCTGGGC GCAATGCGCG CCATTACCGA GTCCGGGCTG CGCGTTGGTG CGGATATCTC
481 GGTAGTGGGA TACGACGATA CCGAAGACAG CTCATGTTAT ATCCCGCCGT CAACCACCAT
541 CAAACAGGAT TTTTCGCTGC TGGGGCAAAC CAGCGTGGAC CGTTTGCTGC AACTCTCTCA
601 GGGCCAGGCG GTGAAGGGCA ATCAGCTGTT GCCCGTCTCA CTGGTGAAAA GAAAAACCAC
661 CCTGGCACCC AATACGCAAA CCGCCTCTCC CCGCGCGTTG GCCGATTCAT TAATGCAGCT
721 GGCACGACAG GTTTCCCGAC TGGAAAGCGG GCAGTGAGCG CAACGCAATT AATGTGAGTT
781 AGCGCGAATT GATCTGGTTT GACAGCTTAT CATCGACTGC ACGGTGCACC AATGCTTCTG
841 GCGTCAGGCA GCCATCGGAA GCTGTGGTAT GGCTGTGCAG GTCGTAAATC ACTGCATAAT
901 TCGTGTGCTC CAAGGCGCAC TCCCGTTCTG GATAATGTTT TTTGCGCCGA CATCATAACG
961 GTTCTGGCAA ATATTCTGAA ATGAGCTGTT GACAATTAAT CATCCGGTCC GTATAATCTG
1021 TGGAATTGTG AGCGGATAAC AATTTACAC AGGAAACAGA CCATGTCGTA CTACCATCAC
1081 CATCACCATC ACGGCATCAC AAGTTTGTAC AAAAAAGCTG AACGAGAAAC GTAAAATGAT
1141 ATAAATATCA ATATATTAAA TTAGATTTTG CATAAAAAAC AGACTACATA ATACTGTAAA
1201 ACACAACATA TCCAGTCACT ATGGCGGCCG CTAAGTTGGC AGCATCACCC GACGCACTTT
1261 GCGCCGAATA AATACCTGTG ACGGAAGATC ACTTCGCAGA ATAAATAAAT CCTGGTGTCC
1321 CTGTTGATAC CGGGAAGCCC TGGGCCAACT TTTGGCGAAA ATGAGACGTT GATCGGCACG
1381 TAAGAGGTTT CAACTTTCAC CATAATGAAA TAAGATCACT ACCGGGCGTA TTTTTTGAGT
1441 TATCGAGATT TTCAGGAGCT AAGGAAGCTA AAATGGAGAA AAAAATCACT GGATATACCA
1501 CCGTTGATAT ATCCCAATGG CATCGTAAAG AACATTTTGA GGCATTTTCA TCAGTTGCTC
1561 AATGTACCTA TAACCAGACC GTTCAGCTGG ATATTACGGC CTTTTTAAAG ACCGTAAAGA
1621 AAAATAAGCA CAAGTTTTAT CCGGCCTTTA TTCACATTCT TGCCCGCCTG ATGAATGCTC
1681 ATCCGGAATT CCGTATGGCA ATGAAAGACG GTGAGCTGGT GATATGGGAT AGTGTTCACC
1741 CTTGTTACAC CGTTTTCCAT GAGCAAACCTG AAACGTTTTT ATCGCTCTGG AGTGAATACC
1801 ACGACGATTT CCGGCAGTTT CTACACATAT ATTCGCAAGA TGTGGCGTGT TACGGTGAAA
1861 ACCTGGCCTA TTTCCCTAAA GGGTTTATTG AGAATATGTT TTTCTGTCTA GCCAATCCCT
1921 GGGTGAGTTT CACCAAGTTT GATTTAAACG TGGCCAATAT GGACAACCTT TTCGCCCCCG
1981 TTTTCACCAT GGGCAAATAT TATACGCAAG GCGACAAGGT GCTGATGCCG CTGGCGATTTC
2041 AGGTTTCATCA TGCCGTCTGT GATGGCTTCC ATGTGGGCAG AATGCTTAAT GAATTACAAC
2101 AGTACTGCGA TGAGTGGCAG GCGGGGGCGT AAACGCGTGG ATCCGGCTTA CTAAGGCCA
2161 GATAACAGTA TGCGTATTTG CGCGCTGATT TTTGCGGTAT AAGAATATAT ACTGATATGT
2221 ATACCCGAAG TATGTCAAAA AGAGGTGTGC TATGAAGCAG CGTATTACAG TGACAGTTGA
2281 CAGCGACAGC TATCAGTTGC TCAAGGCATA TATGATGTCA ATATCTCCGG TCTGGTAAGC
2341 ACAACCATGG AGAATGAAGC CCGTCGTCTG CGTGCCGAAC GCTGGAAAAGC GGAAAATCAG
2401 GAAGGGATGG CTGAGGTCGC CCGGTTTATT GAAATGAACG GCTCTTTTGC TGACGAGAAC
2461 AGGGACTGGT GAAATGCAGT TTAAGGTTTA CACCTATAAA AGAGAGAGCC GTTATCGTCT
2521 GTTTGTGGAT GTACAGAGTG ATATTATTGA CACGCCCGGG CGACGGATGG TGATCCCCCT-

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FIGURE 22B

2581 GGCCAGTGCA CGTCTGCTGT CAGATAAAGT CTCCCCGTGAA CTTTACCCGG TGTGTCATAT
 2641 CGGGGATGAA AGCTGGCGCA TGATGACCAC CGATATGGCC AGTGTGCCCG TCTCCGTTAT
 2701 CGGGGAAGAA GTGGCTGATC TCAGCCACCG CGAAAATGAC ATCAAAAACG CCATTAACCT
 2761 GATGTTCTGG GGAATATAAA TGTCAGGCTC CTTATACAC AGCCAGTCTG CAGGTCGACC
 2821 ATAGTGA CTG GATATGTTGT GTTTTACAGT ATTATGTAGT CTGTTTTTTA TGCAAAATCT
 2881 AATTTAATAT ATTGATATTT ATATCAATTT ACGTTTCTCG TTCAGCTTTC TTGTACAAAG
 2941 TGGTGATGCC CATATGGGAA TTCAAAGGCC TACGTCGACG AGCTCACTAG TCGCGGCCG
 3001 TTCTAGAGGA TCCCTCGAGG CATGCGGTAC CAAGCTTGGC TGTTTTGGCG GATGAGAGAA
 3061 GATTTTCAGC CTGATACAGA TTAAATCAGA ACGCAGAAGC GGTCTGATAA AACAGAATTT
 3121 CCCTGGCGCG AGTAGCGCGG TGGTCCCACC TGACCCCATG CCGAACTCAG AAGTGAAACG
 3181 CCGTAGCGCC GATGGTAGTG TGGGGTCTCC CCATGCGAGA GTAGGGAAGT GCCAGGCATC
 3241 AAATAAAACG AAAGGCTCAG TCGAAAGACT GGGCCTTTTCG TTTTATCTGT TGTGTGTCGG
 3301 TGAACGCTCT CCTGAGTAGG ACAAATCCGC CGGGAGCGGA TTTGAACGTT GCGAAGCAAC
 3361 GGCCCGGAGG GTGGCGGGCA GGACGCCCGC CATAAACTGC CAGGCATCAA ATTAAGCAGA
 3421 AGGCCATCCT GACGGATGGC CTTTTTGCGT TTCTACAAAC TCTTTTTTGT TATTTTTCTA
 3481 AATACATTCA AATATGTATC CGCTCATGAG ACAATAACCC TGATAAATGC TTCAATAATA
 3541 TTGAAAAAGG AAGATGTAGA GTATTCAACA TTTCCGTGTC GCCCTTATTC CTTTTTTTGC
 3601 GGCATTTTGC CTTCTGTGTT TTGCTCACC AGAAACGCTG GTGAAAGTAA AAGATGCTGA
 3661 AGATCAGTTG GTGTCACGAG TGGGTACAT CGAACTGGAT CTCAACAGCG GTAAGATCCT
 3721 TGAGAGTTTT CGCCCCGAAG AACGTTTTCC AATGATGAGC ACTTTTAAAG TTCTGCTATG
 3781 TGGCGCGGTA TTATCCCGTG TTGACGCCGG GCAAGAGCAA CTCGGTCGCC GCATACACTA
 3841 TTCTCAGAA GACTTGGTTG AGTACTCACC AGTCACAGAA AAGCATCTTA CGGATGGCAT
 3901 GACAGTAAGA GAATTATGCA GTGCTGCCAT AACCATGAGT GATAACACTG CGGCCAACTT
 3961 ACTTCGACA ACGATCGGAG GACCGAAGGA GCTAACCGCT TTTTTGCACA ACATGGGGGA
 4021 TCATGTAAC CGCCTTGATC GTTGGGAACC GGAGCTGAAT GAAGCCATAC CAAACGACGA
 4081 GCGTGACACC ACGATGCCTA CAGCAATGGC AACACGTTG CGCAAATAT TAACTGGCGA
 4141 ACTACTTACT CTAGCTTCCC GGCAACAATT AATAGACTGG ATGGAGGCGG ATAAAGTTGC
 4201 AGGACCATT CTGCGCTCGG CCCTTCCGGC TGGCTGGTTT ATTGCTGATA AATCTGGAGC
 4261 CGGTGAGCGT GGGTCTCGCG GTATCATTGC AGCACTGGGG CCAGATGGTA AGCCCTCCCG
 4321 TATCGTAGTT ATCTACACGA CGGGGAGTCA GGCAACTATG GATGAACGAA ATAGACAGAT
 4381 CGCTGAGATA GGTGCCTCAC TGATTAAGCA TTGGTAACTG TCAGACCAAG TTTACTCATA
 4441 TATACTTTAG ATTGATTTAA AACTTCATT TTAATTTAAA AGGATCTAGG TGAAGATCCT
 4501 TTTTGATAAT CTCATGACCA AAATCCCTTA ACGTGAGTTT TCGTTCCTACT GAGCGTCAGA
 4561 CCCCCTAGAA AAGATCAAAG GATCTTCTTG AGATCCTTTT TTTCTGCGCG TAATCTGCTG
 4621 CTGCAAAACA AAAAAAGTAA CGCTACCAGC GGTGGTTTGT TTGCCGGATC AAGAGCTACC
 4681 AACTCTTTT CCGAAGGTAA CTGGCTTCAG CAGAGCGCAG ATACCAAATA CTGTCCTTCT
 4741 AGTGTAGCCG TAGTTAGGCC ACCACTTCAA GAACTCTGTA GCACCGCCTA CATACTCGC
 4801 TCTGCTAATC CTGTTACCAG TGGCTGCTGC CAGTGGCGAT AAGTCTGTCT TTACCGGGTT
 4861 GGACTCAAGA CGATAGTTAC CGGATAAGGC GCAGCGGTCT GGCTGAACGG GGGGTTCTGT
 4921 CACACAGCCC AGCTTGAGGC GAACGACCTA CACCGAACTG AGATACCTAC AGCGTGAGCT
 4981 ATGAGAAAGC GCCACGCTTC CCGAAGGGAG AAAGGCGGAC AGGTATCCGG TAAGCGGCAG
 5041 GGTCGGAACA GGAGAGCGCA CGAGGGAGCT TCCAGGGGGA AACGCCTGGT ATCTTTATAG
 5101 TCCTGTCCGG TTTCCGCCACC TCTGACTTGA GCGTCGATTT TTGTGATGCT CGTCAGGGGG
 5161 GCGGAGCCTA TGGAAAAACG CCAGCAACGC GGCCTTTTTA CGGTTCTCTG CCTTTTGCTG
 5221 GCCTTTTGCT CACATGTTCT TTCCTGCGTT ATCCCCTGAT TCTGTGGATA ACCGTATTAC
 5281 CGCCTTTGAG TGAGCTGATA CCGCTCGCCG CAGCCGAACG ACCGAGCGCA GCGAGTCAGT
 5341 GAGCGAGGAA GCGGAAGAGC GCCTGATGCG GTATTTTCTC CTTACGCATC TGTGCGGTAT
 5401 TTCACACCGC ATAATTTTGT TAAATTCGC GTTAAATTTT TGTAAATCA GTCATTTTTT
 5461 TAACCAATAG GCCGAAATCG GCAAATCCC TTATAAATCA AAGAATAGA CCGAGATAGG
 5521 GTTGAGTGTT GTTCCAGTTT GGAACAAGG TCCCATATTA AAGAAGCTGG ACTCCAACGT
 5581 CAAAGGGCGA AAAACCGTCT ATCAGGGCGA TGGCCCACTA CGTGAACCAT CACCCTAATC
 5641 AAGTTTTTTG GGGTCGAGGT GCCGTAAAGC ACTAAATCGG AACCTTAAAG GGAGCCCCCG
 5701 ATTTAGAGCT TGACGGGGAA AGCCGCGGAA CGTGGCGAGA AAGGAAGGGA AGAAAGCGAA
 5761 AGGAGCGGGC GCTAGGGCGC TGGCAAGTGT AGCGGTCACG CTGCGCGTAA CCACCACACC
 5821 CGCCGCGCTT AATGCGCCGC TACAGGGCGC GTCCCATTCG CCATTACAGG TGCTATGGTG
 5881 CACTCTCAGT ACAATCTGCT CTGATGCCGC ATAGTTAAGC CAGTATACAC TCCGCTATCG
 5941 CTACGTGACT GGGTCATGGC TGCGCCCCGA CACCCGCCAA CACCCGCTGA CGCGCCCTGA
 6001 CGGGCTTGTC TGCTCCCGGC ATCCGCTTAC AGACAAGCTG TGACCCTCTC CGGGAGCTGC-

FIGURE 22C

6061	ATGTGTCAGA	GGTTTTTCACC	GTCATCACCG	AAACGCGCGA	GGCAGCAGAT	CAATTCGCGC
6121	GCGAAGGCGA	AGCGGCATGC	ATTTACGTTG	ACACCATCGA	ATGGTGCAAA	ACCTTTCGCG
6181	GTATGGCATG	ATAGCGCCCG	GAAGAGAGTC	AATTCAGGGT	GGTGAATGTG	AAACCAGTAA
6241	CGTTATACGA	TGTCGCAGAG	TATGCCGGTG	TCTCTTATCA	GACCGTTTCC	CGCGTGGTGA
6301	ACCAGGCCAG	CCACGTTTCT	GCGAAAACGC	GGGAAAAAGT	GGAAGCGGCG	ATGGCGGAGC
6361	TGAATTACAT	TCCCAACCGC	GTGGCACAAC	AACTGGCGGG	CAAACAGTCG	TTGCTGATTG
6421	GCGTTGCCAC	CTCCAGTCTG	GCCCTGCACG	CGCCGTCGCA	AATTGTCGCG	GCGATTAAAT
6481	CTCGCGCCGA	TCAACTGGGT	GCCAGCGTGG	TGGTGTCGAT	GGTAGAACGA	AGCGGCGTCG
6541	AAGCCTGTAA	AGC				

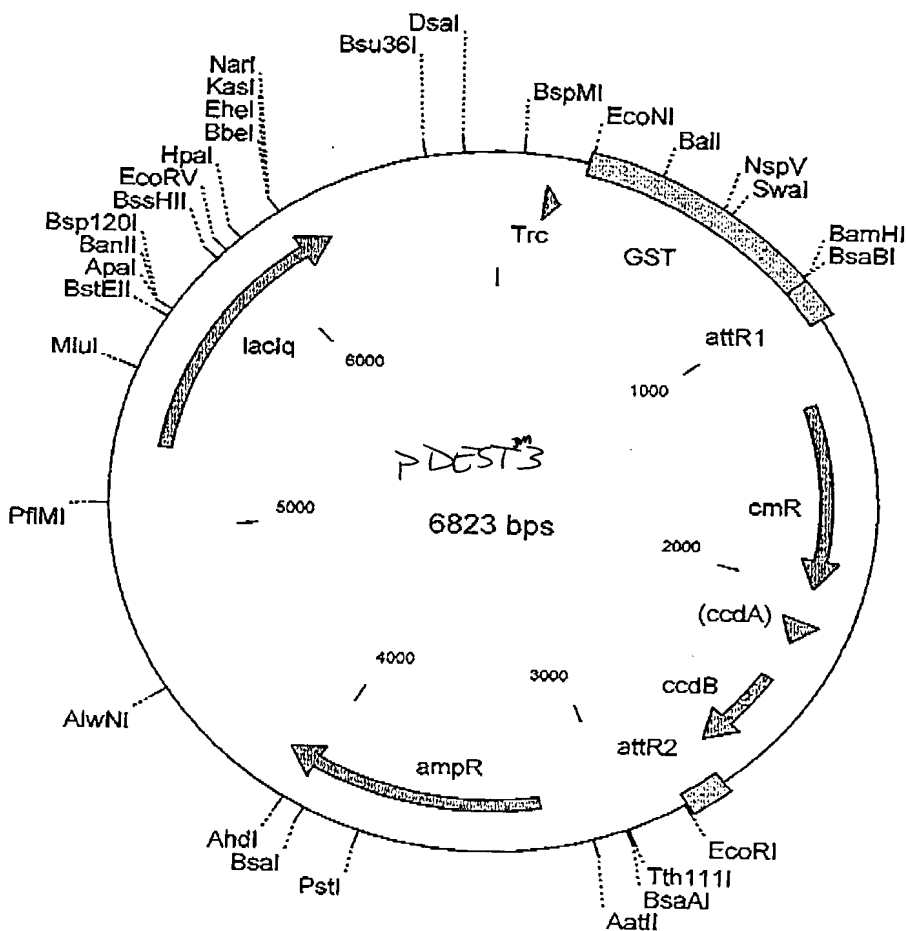
6061 6121 6181 6241 6301 6361 6421 6481 6541

FIGURE 22D

GST fusions in E. coli

919 111 GST → R G S R R A S V G S P S T S
 ctg gtt ccg cgt gga tct cgt cgt gca tct gtt gga tcc cca tca aca agt
 gac caa ggc gca cct aga gca gca cgt aga caa cct agg ggt agt tgt tca

970 4 Y K K
~~ttg cac aaa aaa gct gaa cga gaa acg taa aat gat ata aat acc aat ata~~
~~aac atg ttt ttt cga ctt gct cct tgc att tta cta tat tta tag tta tat~~ ~~att~~



pDEST3 6823 bp

Location (Base Nos.)	Gene Encoded
150..200	Trc
1087..963	attR1
1337..1996	CmR
2116..2200	inactivated ccdA
2338..2643	ccdB
2684..2808	attR2
3231..4091	ampR
5295..6254	lacIq

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1  ACGTTATCGA CTGCACGGTG CACCAATGCT TCTGGCGTCA GGCAGCCATC GGAAGCTGTG
61 GTATGGCTGT GCAGGTCGTA AATCACTGCA TAATTCGTGT CGCTCAAGGC GCACTCCCGT
121 TCTGGATAAT GTTTTTTTGCG CCGACATCAT AACGGTTCTG GCAAATATTC TGAAATGAGC
181 TGTTGACAAT TAATCATCGG CTCGTATAAT GTGTGGAATT GTGAGCGGAT AACAAATTTCA
241 CACAGGAAAC AGTATTCATG TCCCCTATAC TAGGTTATTG GAAAATTAAG GGCCTTGTGC
301 AACCCACTCG ACTTCTTTTG GAATATCTTG AAGAAAAATA TGAAGAGCAT TTGTATGAGC
361 GCGATGAAGG TGATAAATGG CGAAACAAAA AGTTTGAATT GGGTTTGGAG TTTCCCAATC
421 TTCCTTATTA TATTGATGGT GATGTTAAAT TAACACAGTC TATGGCCATC ATACGTTATA
481 TAGCTGACAA GCACAACATG TTGGGTGGTT GTCCAAAAGA GCGTGCAGAG ATTTCAATGC
541 TTGAAGGAGC GGTTTTGGAT ATTAGATACG GTGTTTCGAG AATTGCATAT AGTAAAGACT
601 TTGAAACTCT CAAAGTTGAT TTTCTTAGCA AGCTACCTGA AATGCTGAAA ATGTTCGAAG
661 ATCGTTTATG TCATAAAACA TATTTAAATG GTGATCATGT AACCCATCCT GACTTCATGT
721 TGTATGACGC TCTTGATGTT GTTTTATACA TGGACCCAAT GTGCCTGGAT GCGTTCCCAA
781 AATTAGTTTG TTTTAAAAAA CGTATTGAAG CTATCCCACA AATTGATAAG TACTTGAAAT
841 CCAGCAAGTA TATAGCATGG CTTTGCAGG GCTGGCAAGC CACGTTTGGT GGTGGCGACC
901 ATCCTCCAAA ATCGGATCTG GTTCCGCGTG GATCTCGTCG TGCATCTGTT GGATCCCCAT
961 CAACAAGTTT GTACAAAAAA GCTGAACGAG AAACGTAAAA TGATATAAAT ATCAATATAT
1021 TAAATTAGAT TTTGCATAAA AAACAGACTA CATAATACTG TAAAACACAA CATATCCAGT
1081 CACTATGGCG GCCGCTAAGT TGGCAGCATC ACCCGACGCA CTTTGCGCCG AATAAATACC
1141 TGTGACGGAA GATCACTTCG CAGAATAAAT AAATCCTGGT GTCCCTGTTG ATACCGGGAA
1201 GCCCTGGGCC AACTTTTGGC GAAAATGAGA CGTTGATCGG CACGTAAGAG GTTCCAACCT
1261 TCACCATAAT GAAATAAGAT CACTACCGGG CGTATTTTTT GAGTTATCGA GATTTTCAGG
1321 AGCTAAGGAA GCTAAAATGG AGAAAAAAAT CACTGGATAT ACCACCGTTG ATATATCCCA
1381 ATGGCATCGT AAAGAACATT TTGAGGCATT TCAGTCAGTT GCTCAATGTA CCTATAACCA
1441 GACCGTTCAG CTGGATATTA CGGCCTTTTT AAAGACCGTA AAGAAAAATA AGCACAAGTT
1501 TTATCCGGCC TTTATTCACA TTCTTGCCCG CCTGATGAAT GCTCATCCGG AATTCCGTAT
1561 GGCAATGAAA GACGGTGAGC TGGTGATATG GGATAGTGTT CACCCTTGTT ACACCGTTTT
1621 CCATGAGCAA ACTGAAACGT TTTTCATCGT CTGGAGTGAA TACCACGACG ATTTCCGGCA
1681 GTTCTACAC ATATATTCGC AAGATGTGGC GTGTTACGGT GAAAACCTGG CCTATTTCCC
1741 TAAAGGGTTT ATTGAGAATA TGTTTTTCGT CTCAGCCAAT CCCTGGGTGA GTTTCACCAG
1801 TTTTGATTTA AACGTGGCCA ATATGGACAA CTTCTTCGCC CCCGTTTTCA CCATGGGCAA
1861 ATATTATACG CAAGGCGACA AGGTGCTGAT GCCGCTGGCG ATTCAGGTTT ATCATGCCGT
1921 CTGTGATGGC TTCCATGTCG GCAGAATGCT TAATGAATTA CAACAGTACT GCGATGAGTG
1981 GCAGGGCGGG GCGTAAAGAT CTGGATCCGG CTTACTAAAA GCCAGATAAC AGTATGCGTA
2041 TTTGCGCGCT GATTTTGTGG GTATAAGAA ATATACTGAT ATGTATACCC GAAGTATGTC
2101 AAAAAGAGGT GTGCTATGAA GCAGCGTATT ACAGTGACAG TTGACAGCGA CAGCTATCAG
2161 TTGCTCAAGG CATATATGAT GTCAATATCT CCGGTCTGGT AAGCACAACC ATGCAGAATG
2221 AAGCCCGTCG TCTGCGTGCC GAACGCTGGA AAGCGGAAAA TCAGGAAGGG ATGGCTGAGG
2281 TCGCCCGGTT TATTGAAATG AACGGCTCTT TTGCTGACGA GAACAGGGAC TGGTGAAATG
2341 CAGTTTAAGG TTTACACCTA TAAAAGAGAG AGCCGTTATC GTCTGTTTGT GGATGTACAG
2401 AGTGATATTA TTGACACGCC CGGGCGACGG ATGGTGATCC CCCTGGCCAG TGCACGCTCTG
2461 CTGTCAGATA AAGTCTCCCG TGAACTTTAC CCGGTGGTGC ATATCGGGGA TGAAAGCTGG
2521 CGCATGATGA CCACCGATAT GGCCAGTGTG CCGGTCTCCG TTATCGGGGA AGAAGTGGCT
2581 GATCTCAGCC ACCGCGAAAA TGACATCAA AACGCCATTA ACCTGATGTT CTGGGGAATA
2641 TAAATGTCAG GCTCCCTTAT ACACAGCCAG TCTGCAGGTC GACCATAGTT ACTGGATATG-

```

FIGURE 23B

2701 TTGTGTTTTA CAGTATTATG TAGTCTGTTT TTTATGCAAA ATCTAATTTA ATATATTGAT
2761 ATTTATATCA TTTTACGTTT CTCGTTTCAGC TTTCTTGTAAC AAAGTGGTTG ATGGGAATTC
2821 ATCGTGACTG ACTGACGATC TGCCTCGCGC GTTTCGGTGA TGACGGTGA- AACCTCTGAC
2881 ACATGCAGCT CCCGAGACG GTCACAGCTT GTCTGTAAGC GGATGCCGGG AGCAGACAAG
2941 CCCGTCAGGG CGCGTCAGCG GGTGTTGGCG GGTGTCGGGG CGCAGCCATG ACCCAGTCAC
3001 GTAGCGATAG CGGAGTGTAT AATTCTTGAA GACGAAAGGG CCTCGTGATA CGCCTATTTT
3061 TATAGGTAA TGTCATGATA ATAATGGTTT CTTAGACGTC AGGTGGCAGT TTTCCGGGAA
3121 ATGTGCGCGG AACCCCTATT TGTTTATTTT TCTAAATACA TTCAAATATG TATCCGCTCA
3181 TGAGACAATA ACCCTGATAA ATGCTTCAAT AATATTGAAA AAGGAAGAGT ATGAGTATTC
3241 AACATTCCG TGTCGCCCTT ATTCCTTTTT TTGCGGCATT TTGCCTTCCT GTTTTTTGCTC
3301 ACCCAGAAAC GCTGGTGAAA GTAAAAGATG CTGAAGATCA GTTGGGTGCA CGAGTGGGTT
3361 ACATCGAAGT GGATCTCAAC AGCGGTAAAG TCCTTGAGAG TTTTCGCCCC GAAGAACGTT
3421 TTCCAATGAT GAGCACTTTT AAAGTTCTGC TATGTGGCGC GGTATTATCC CGTGTGACG
3481 CCGGGCAAGA GCAACTCGGT CGCCGCATAC ACTATTCTCA GAATGACTTG GTTGAGTACT
3541 CACCAGTCAC AGAAAAGCAT CTTACGGATG GCATGACAGT AAGAGAATTA TGCAGTGCTG
3601 CCATAACCAT GAGTGATAAC ACTGCGGCCA ACTTACTTCT GACAACGATC GGAGGACCGA
3661 AGGAGCTAAC CGCTTTTTTG CACAACATGG GGGATCATGT AACTCGCCTT GATCGTTGGG
3721 AACCAGGAGT GAATGAAGCC ATACCAAACG ACGAGCGTGA CACCACGATG CCTGCAGCAA
3781 TGGCAACAAC GTTGCGCAAA CTATTAAGT GCGAACTACT TACTCTAGCT TCCCGGCAAC
3841 AATTAATAGA CTGGATGGAG GCGGATAAAG TTGCAGGACC ACTTCTGCGC TCGGCCCTTC
3901 CGGCTGGCTG GTTTATTGCT GATAAATCTG GAGCCGGTGA GCGTGGGTCT CGCGGTATCA
3961 TTGCAGCACT GGGGCCAGAT GGTAAGCCCT CCCGTATCGT AGTTATCTAC ACGACGGGGA
4021 GTCAGGCAAC TATGGATGAA CGAAATAGAC AGATCGCTGA GATAGGTGCC TCACTGATTA
4081 AGCATTGGTA ACTGTGAGC CAAGTTTACT CATATATACT TTAGATTGAT TTAAAACTTC
4141 ATTTTTAATT TAAAAGGATC TAGGTGAAGA TCCTTTTGA TAATCTCATG ACCAAAATCC
4201 CTTAACGTGA GTTTTCGTTT CACTGAGCGT CAGACCCCGT AGAAAAGATC AAAGGATCTT
4261 CTTGAGATCC TTTTTTTCTG CGCGTAATCT GCTGCTTGCA AACAAAAAAA CCACCGCTAC
4321 CAGCGGTGGT TTGTTTGCCG GATCAAGAGC TACCAACTCT TTTTCCGAAG GTAAGTGGCT
4381 TCAGCAGAGC GCAGATACCA AATACTGTCC TTCTAGTGTA GCCGTAGTTA GGCCACCACT
4441 TCAAGAACTC TGTAGCACC GCTACATACC TCGCTCTGCT AATCCTGTTA CCAGTGGCTG
4501 CTGCCAGTGG CGATAAGTCG TGTCTTACCG GGTGACTC AAGACGATAG TTACCGGATA
4561 AGGCGCAGCG GTCGGGCTGA ACGGGGGGTT CGTGACACACA GCCCAGCTTG GAGCGAACGA
4621 CCTACACCGA ACTGAGATAC CTACAGCGTG AGCTATGAGA AAGCGCCACG CTTCGCCAAG
4681 GGAGAAAGGC GGACAGGTAT CCGGTAAGCG GCAGGGTCGG AACAGGAGAG CGCAGGAGGG
4741 AGCTTCCAGG GGGAAACGCC TGGTATCTTT ATAGTCCTGT CGGGTTTCGC CACCTCTGAC
4801 TTGAGCGTCG ATTTTTGTGA TGCTCGTCAG GGGGGCGGAG CCTATGGAAA AACGCCAGCA
4861 ACGCGGCCTT TTTACGGTTC CTGGCCTTTT GCTGGCCTTT TGCTCACATG TTCTTTCTCTG
4921 CGTTATCCCC TGATTCTGTG GATAACCGTA TTACCGCCTT TGAGTGAGCT GATACCGCTC
4981 GCCGCAGCCG AACGACCGAG CGCAGCGAGT CAGTGAGCGA GGAAGCGGAA GAGCGCCTGA
5041 TGCGGATTTT TCTCCTTACG CATCTGTGCG GTATTTTACA CCGCATAAAT TCCGACACCA
5101 TCGAATGGTG CAAAACCTTT CGCGGTATGG CATGATAGCG CCCGGAAGAG AGTCAATTCA
5161 GGGTGGTGAA TGTGAAACCA GTAACGTTAT ACGATGTCGC AGAGTATGCC GGTGTCTCTT
5221 ATCAGACCGT TTCCCGCGTG GTGAACCAGG CCAGCCACGT TTCTGCGAAA ACGCGGGAAA
5281 AAGTGGAAGC GGCGATGGCG GAGCTGAATT ACATTCCCAA CCGCGTGGCA CAACAACCTG
5341 CGGGCAAACA GTCGTTGCTG ATTGGCGTTG CCACCTCCAG TCTGGCCCTG CACGCGCCGT
5401 CGCAAATTGT CGCGGCGATT AAATCTCGCG CCGATCAACT GGGTGCCAGC GTGGTGGTGT
5461 CGATGGTAGA ACGAAGCGGC GTCGAAGCCT GTAAAGCGGC GGTGCACAAT CTTCTCGCGC
5521 AACGCGTCAG TGGGCTGATC ATTAACCTATC CGCTGGATGA CCAGGATGCC ATTGCTGTGG
5581 AAGCTGCCTG CACTAATGTT CCGGCGTTAT TTCTTGATGT CTCTGACCAG ACACCCATCA
5641 ACAGTATTAT TTTCTCCCAT GAAGACGGTA CGCGACTGGG CGTGAGCAT CTGGTTCGAT
5701 TGGGTCACCA GCAAATCGCG CTGTTAGCGG GCCCATTAAG TTCTGTCTCG GCGCGTCTGC
5761 GTCTGGCTGG CTGGCATAAA TATCTCACTC GCAATCAAAT TCAGCCGATA CCGGAACGGG
5821 AAGGCGACTG GAGTGCCATG TCCGGTTTTT AACAAACCAT GCAAATGCTG AATGAGGGCA
5881 TCGTTCCAC TGCGATGCTG GTTGCCAACG ATCAGATGGC GCTGGGCGCA ATGCGCGCCA
5941 TTACCGAGTC CGGGCTGCGC GTTGGTGGCG ATATCTCGGT AGTGGGATAC GACGATACCG
6001 AAGACAGCTC ATGTTATATC CCGCCGTTAA CCACCATCAA ACAGGATTTT CGCCTGCTGG
6061 GGCAAACAG CGTGGACCGC TTGCTGCAAC TCTCTCAGGG CCAGGCGGTG AAGGGCAATC
6121 AGCTGTTGCC CGTCTCACTG GTGAAAAGAA AAACCACCTT GGCGCCCAAT ACGCAAACCG-

6181	CCTCTCCCCG	CGCGTTGGCC	GATTCATTAA	TGCAGCTGGC	ACGACAGGTT	TCCCGACTGG
6241	AAAGCGGGCA	GTGAGCGCAA	CGCAATTAAT	GTGAGTTAGC	TCACTCATT	GGCACCCAG
6301	GCTTTTACACT	TTATGCTTCC	GGCTCGTATG	TTGTGTGGAA	TTGTGAGCGG	ATAACAATTT
6361	CACACAGGAA	ACAGCTATGA	CCATGATTAC	GGATTCACTG	GCCGTCGTTT	TACAACGTCG
6421	TGACTGGGAA	AACCCTGGCG	TTACCCAACT	TAATCGCCTT	GCAGCACATC	CCCCTTTCGC
6481	CAGCTGGCGT	AATAGCGAAG	AGGCCCGCAC	CGATCGCCCT	TCCCAACAGT	TGCGCAGCCT
6541	GAATGGCGAA	TGGCGCTTTG	CCTGGTTTCC	GGCACCAGAA	GCGGTGCCGG	AAAGCTGGCT
6601	GGAGTGCGAT	CTTCCTGAGG	CCGATACTGT	CGTCGTCCCC	TCAAACCTGGC	AGATGCACGG
6661	TTACGATGCG	CCCATCTACA	CCAACGTAAC	CTATCCCATT	ACGGTCAATC	CGCCGTTTGT
6721	TCCCACGGAG	AATCCGACGG	GTTGTTACTC	GCTCACATTT	AATGTTGATG	AAAGCTGGCT
6781	ACAGGAAGGC	CAGACGCGAA	TTATTTTTGA	TGGCGTTGGA	ATT	

002050 0042750

FIGURE 23D

Figure 24A: pDEST4

His6-thioredoxin fusions in E. coli

919 gca aat att ctg aaa tga gct ggt gac ⁻³⁵ att taa tca tcc ggt ccg ^{Tac promoter} cat aat ⁻¹⁰
 cgt tta taa gac ttt act cga cha ctg tta att agt agg cca ggc ata tta

970 ctg tgg ^{mRNA} laa tgt gag cgg ata aca att tca cac agg aaa cag acc Met Gly
 gac acc tta aca ctc gcc tat tgt taa agt gtg tcc ttt gtc tgg tac cca

His 6

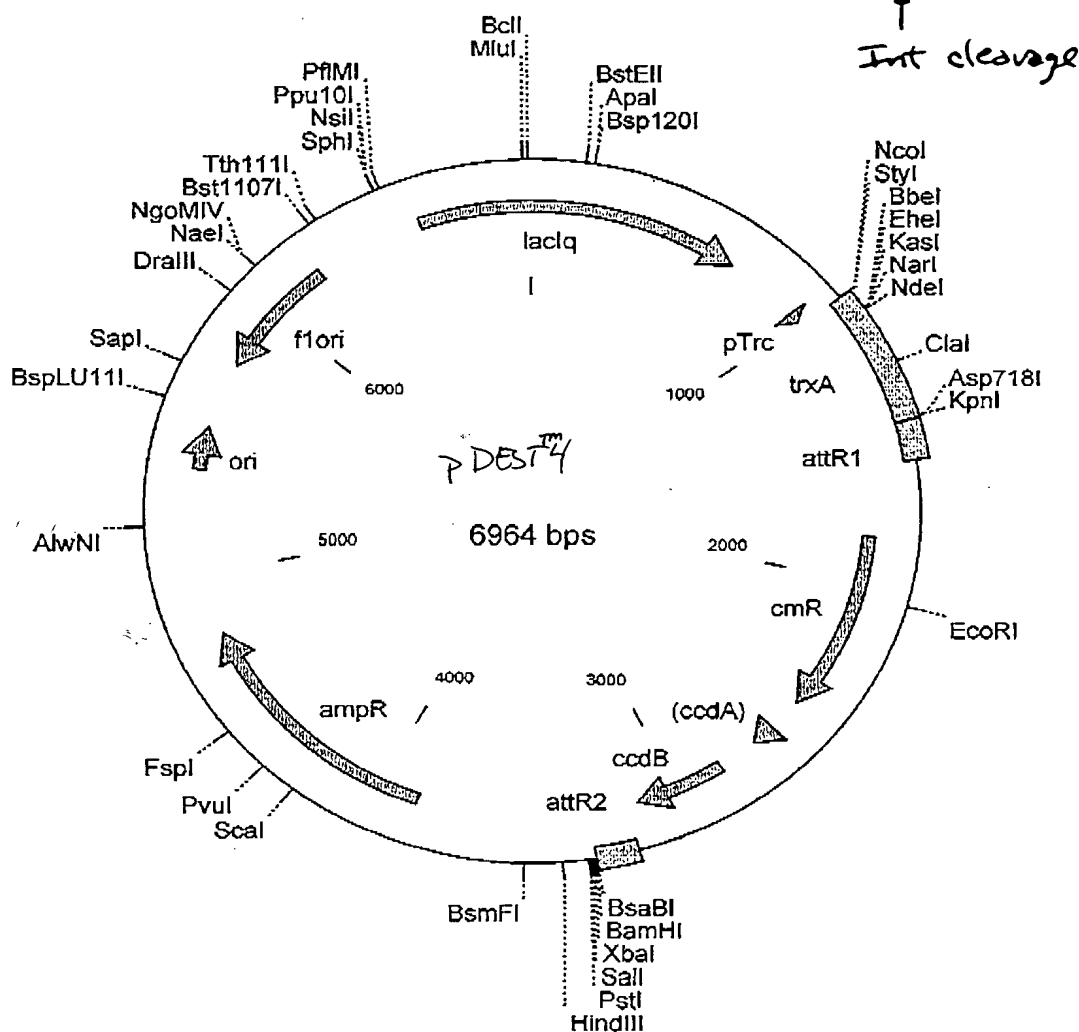
1021 His His His His His His Asp Tyr Asp Ile Pro Thr Thr Gly Asn Lys Tyr
 cat cat cat cat cat cat gat tac gat atc cca acg acc gaa aac ctg tac
 gta gta gta gta gta gtg cta atg cta tag ggt tgc tgg ctt ttg gac ata

TEV protease | Thioredoxin - (150 amino acids)

1072 Pro Gln Gly Ala His Met Ser Asp Lys Ile Ile His Lys Thr Asn Asp Ser
 ttt cag ggt gcc cat atg agc gat aaa att att cac ctg act gac gat agt
 aaa gtc ccg cgg gta tac tgc cta ttt taa taa gtg gac tga ctg ctg tca

attR 1

1429 ~~Gat Asp Asp Asp Lys Val Pro Ile Thr Ser Lys Tyr Lys Lys~~
~~gat gat gat gat aag gta ccc atc tca agt ttg tgc tgc tgc tgc tgc~~
~~cta ctg cta ctg ttc cat ccc tag tgt tca aac atg ttt ttt tga gct gct~~



pDEST4 6964 bp

Location (Base Nos.)	Gene Encoded
964..1003	Trc
1577..1453	attR1
1827..2486	CmR
2606..2690	inactivated ccdA
2828..3133	ccdB
3174..3298	attR2
3872..4777	ampR
5378..5538	ori
5778..6215	flori (f1 intergenic region)
6587..704	lacIq

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1 CTATCCGCTG GATGACCAGG ATGCCATTGC TGTGGAAGCT GCCTGCACTA ATGTTCCGGC
61 GTTATTTCTT GATGTCTCTG ACCAGACACC CATCAACAGT ATTATTTTCT CCCATGAAGA
121 CGGTACGCGA CTGGGCGTGG AGCATCTGGT CGCATTGGGT CACCAGCAAA TCGCGCTGTT
181 AGCGGGCCCA TTAAGTTCTG TCTCGGCGCG TCTGCGTCTG GCTGGCTGGC ATAAATATCT
241 CACTCGCAAT CAAATTCAGC CGATAGCGGA ACGGGAAGGC GACTGGAGTG CCATGTCCGG
301 TTTTCAACAA ACCATGCAAA TGCTGAATGA GGGCATCGTT CCCACTGCGA TGCTGGTTGC
361 CAACGATCAG ATGGCGCTGG GCGCAATGCG CGCCATTACC GAGTCCGGGC TGC GCGTTGG
421 TGCGGATATC TCGGTAGTGG GATACGACGA TACCGAAGAC AGCTCATGTT ATATCCCGCC
481 GTCAACCACC ATCAAACAGG ATTTTCGCCT GCTGGGGCAA ACCAGCGTGG ACCGCTTGCT
541 GCAACTCTCT CAGGGCCAGG CGGTGAAGGG CAATCAGCTG TTGCCCCGCT CACTGGTGAA
601 AAGAAAAACC ACCCTGGCAC CCAATACGCA AACCGCCTCT CCCC GCGCTG TGGCCGATTC
661 ATTAATGCAG CTGGCACGAC AGGTTTCCCG ACTGGAAAGC GGGCAGTGAG CGCAACGCAA
721 TTAATGTGAG TTAGCGCGAA TTGATCTGGT TTGACAGCTT ATCATCGACT GCACGGTGCA
781 CCAATGCTTC TGGCGTCAGG CAGCCATCGG AAGCTGTGGT ATGGCTGTGC AGGTCGTAAA
841 TCACTGCATA ATTCGTGTCG CTCAAGGCGC ACTCCCGTTC TGGATAATGT TTTTTCGCGC
901 GACATCATAA CGGTTCTGGC AAATATTCTG AAATGAGCTG TTGACAATTA ATCATCCGGT
961 CCGTATAATC TGTGGAATTG TGAGCGGATA ACAATTTTAC ACAGGAAACA GACCATGGGT
1021 CATCATCATC ATCATCACGA TTACGATATC CCAACGACCG AAAACCTGTA TTTTCAGGGC
1081 GCCCATATGA GCGATAAAAT TATTCACCTG ACTGACGACA GTTTTGACAC GGATGTACTC
1141 AAAGCGGACG GGGCGATCCT CGTCGATTTT TGGGCAGAGT GGTGCGGTCC GTGCAAAATG
1201 ATCGCCCCGA TTCTGGATGA AATCGCTGAC GAATATCAGG GCAAACCTGAC CGTTGCAAAA
1261 CTGAACATCG ATCAAAACCC TGGCACTGCG CCGAAATATG GCATCCGTGG TATCCCGACT
1321 CTGCTGCTGT TCAAAAACGG TGAAGTGGCG GCAACCAAAG TGGGTGCACT GTCTAAAGGT
1381 CAGTTGAAAG AGTTCCTCGA CGCTAACCTG GCCGGTTCTG GTTCTGGTGA TGACGATGAC
1441 AAGGTACCCA TCACAAGTTT GTACAAAAAA GCTGAACGAG AAACGTAAAA TGATATAAAT
1501 ATCAATATAT TAAATTAGAT TTTGCATAAA AAACAGACTA CATAATACTG TAAACACAA
1561 CATATCCAGT CACTATGGCG GCGGCTAAGT TGGCAGCATC ACCCGACGCA CTTTTCGCGC
1621 AATAAATACC TGTGACGGAA GATCACTTCG CAGAATAAAT AAATCCTGGT GTCCCTGTTG
1681 ATACCGGGAA GCCCTGGGCC AACTTTTGGC GAAAATGAGA CGTTGATCGG CACGTAAGAG
1741 GTTCCAACCT TCACCATAAT GAAATAAGAT CACTACCGGG CGTATTTTTT GAGTTATCGA
1801 GATTTTCAGG AGCTAAGGAA GCTAAAATGG AGAAAAAAT CACTGGATAT ACCACCGTTG
1861 ATATATCCCA ATGGCATCGT AAAGAACATT TTGAGGCATT TCAGTCAGTT GCTCAATGTA
1921 CCTATAACCA GACCGTTCAG CTGGATATTA CGGCCTTTTT AAAGACCGTA AAGAAAAATA
1981 AGCACAAAGT TTATCCGGCC TTTATTCACA TTCTTGCCCG CCTGATGAAT GCTCATCCGG
2041 AATTCCGTAT GGCAATGAAA GACGGTGAGC TGGTGATATG GGATAGTGTT CACCCTTGTT
2101 ACACCGTTTT CCATGAGCAA ACTGAAACGT TTTCATCGCT CTGGAGTGAA TACCACGACG
2161 ATTTCCGGCA GTTTCTACAC ATATATTTCG AAGATGTGGC GTGTTACGGT GAAAACCTGG
2221 CCTATTTCCT TAAAGGGTTT ATTGAGAATA TGTTTTTCGT CTCAGCCAAT CCCTGGGTGA
2281 GTTTCACCA G TTTTGATTTA AACGTGGCCA ATATGGACAA CTTCTTCGCC CCCGTTTTCA
2341 CATGGGCAA ATATTATACG CAAGGCGACA AGGTGCTGAT GCCGCTGGCG ATTCAGTTTC
2401 ATCATGCCGT CTGTGATGGC TTCCATGTCG GCAGAATGCT TAATGAATTA CAACAGTACT
2461 GCGATGAGTG GCAGGGCGGG GCGTAAACGC GTGGATCCGG CTTACTAAAA GCCAGATAAC
2521 AGTATGCGTA TTTGCGCGCT GATTTTTGCG GTATAAGAA ATATACTGAT ATGTATACCC-

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FIGURE 24B

2581 GAAGTATGTC AAAAAGAGGT GTGCTATGAA GCAGCGTATT ACAGTGACAG TTGACAGCGA
2641 CAGCTATCAG TTGCTCAAGG CATATATGAT GTCAATATCT CCGGTCTGGT AAGCACAACC
2701 ATGCAGAATG AAGCCCGTCG TCTGCGTGCC GAACGCTGGA AAGCGGAAAA TCAGGAAGGG
2761 ATGGCTGAGG TCGCCCGGTT TATTGAAATG AACGGCTCTT TTGCTGACGA GAACAGGGAC
2821 TGGTGAAATG CAGTTTAAGG TTTACACCTA TAAAAGAGAG AGCCGTTATC GTCTGTTTGT
2881 GGATGTACAG AGTGATATTA TTGACACGCC CGGGCGACGG ATGGTGATCC CCCTGGCCAG
2941 TGCACGTCTG CTGTCAGATA AAGTCTCCCG TGAACCTTAC CCGGTGGTGC ATATCGGGGA
3001 TGAAAGCTGG CGCATGATGA CCACCGATAT GGCCAGTGTG CCGGTCTCCG TTATCGGGGA
3061 AGAAGTGGCT GATCTCAGCC ACCCGGAAAA TGACATCAAA AACGCCATTA ACCTGATGTT
3121 CTGGGGGAATA TAAATGTCAG GCTCCCTTAT ACACAGCCAG TCTGCAGGTC GACCATAGTG
3181 ACTGGATATG TTGTGTTTTA CAGTATTATG TAGTCTGTTT TTTATGCAAA ATCTAATTTA
3241 ATATATTGAT ATTTATATCA TTTTACGTTT CTCGTTTCAGC TTTCTTGATC AAAGTGGTGA
3301 TGGGGATCCT CTAGAGTCGA CCTGCAGTAA TCGTACAGGG TAGTACAAAT AAAAAAGGCA
3361 CGTCAGATGA CGTGCCTTTT TTCTTGAGAG CAGTAAGCTT GGCTGTTTTG GCGGATGAGA
3421 GAAGATTTTC AGCCTGATAC AGATTAAATC AGAACGCAGA AGCGGTCTGA TAAAACAGAA
3481 TTTGCCTGGC GGCAGTAGCG CGGTGGTCCC ACCTGACCCC ATGCCGAAC CAGAAGTGAA
3541 ACGCCGTAGC GCCGATGGTA GTGTGGGGTC TCCCCATGCG AGAGTAGGGA ACTGCCAGGC
3601 ATCAAATAAA ACGAAAGGCT CAGTCGAAAG ACTGGGCCTT TCGTTTTATC TGTGTTTTGT
3661 CCGTGAAACGC TCTCCTGAGT AGGACAAATC CGCCGGGAGC GGATTTGAAC GTTGCGAAGC
3721 AACGGCCCGG AGGGTGGCGG GCAGGACGCC CGCCATAAAC TGCCAGGCAT CAAATTAAGC
3781 AGAAGGCCAT CCTGACGGAT GGCCTTTTTG CGTTTCTACA AACTCTTTTT GTTTATTTTT
3841 CTAAATACAT TCAAATATGT ATCCGCTCAT GAGACAATAA CCCTGATAAA TGCTTCAATA
3901 ATATTGAAAA AGGAAGAGTA TGAGTATTCA ACATTTCCGT GTCGCCCTTA TTCCCTTTTT
3961 TGCGGCATTT TGCCCTTCCTG TTTTGTCTCA CCCAGAAACG CTGGTGAAAG TAAAAGATGC
4021 TGAAGATCAG TTGGGTGCAC GAGTGGGTTA CATCGAACTG GATCTCAACA GCGGTAAGAT
4081 CCTTGAGAGT TTTGCCCCCG AAGAACGTTT TCCAATGATG AGCACTTTTA AAGTCTGCT
4141 ATGTGGCGCG GTATTATCCC GTGTTGACGC CGGGCAAGAG CAACTCGGTC GCCGCATACA
4201 CTATTCTCAG AATGACTTGG TTGAGTACTC ACCAGTCACA GAAAAGCATC TTACGGATGG
4261 CATGACAGTA AGAGAATTAT GCAGTGCTGC CATAACCATG AGTGATAACA CTGCGGCCAA
4321 CTTACTTCTG ACAACGATCG GAGGACCGAA GGAGCTAACC GCTTTTTTGC ACAACATGGG
4381 GGATCATGTA ACTCGCCTTG ATCGTTGGGA ACCGGAGCTG AATGAAGCCA TACCAAACGA
4441 CGAGCGTGAC ACCACGATGC CTACAGCAAT GGCAACAACG TTGCGCAAAC TATTAAGTGG
4501 CGAACTACTT ACTCTAGCTT CCCGGCAACA ATTAATAGAC TGGATGGAGG CGGATAAAGT
4561 TGCAGGACCA CTTCTGCGCT CGGCCCTTCC GGCTGGCTGG TTTATTGCTG ATAAATCTGG
4621 AGCCGGTGAG CGTGGGTCTC GCGGTATCAT TGCAGCACTG GGGCCAGATG GTAAGCCCTC
4681 CCGTATCGTA GTTATCTACA CGACGGGGAG TCAGGCAACT ATGGATGAAC GAAATAGACA
4741 GATCGCTGAG ATAGGTGCCT CACTGATTAA GCATTGGTAA CTGTCAGACC AAGTTTACTC
4801 ATATATACTT TAGATTGATT TAAAACCTCA TTTTAAATTT AAAAGGATCT AGGTGAAGAT
4861 CCTTTTCTGT AATCTCATGA CAAAATCCC TTAACGTGAG TTTTCGTTCC ACTGAGCGTC
4921 AGACCCCGTA GAAAAGATCA AAGGATCTTC TTGAGATCCT TTTTTCTGCG GCGTAATCTG
4981 CTGCTTGCAA ACAAAAAAAC CACCGCTACC AGCGGTGGTT TGTTTGCCGG ATCAAGAGCT
5041 ACCAACTCTT TTTCCGAAGG TAACTGGCTT CAGCAGAGCG CAGATACCAA ATACTGTCCT
5101 TCTAGTGTAG CCGTAGTTAG GCCACCACTT CAAGAACTCT GTAGCACCGC CTACATACCT
5161 CGCTCTGCTA ATCCTGTTAC CAGTGGCTGC TGCCAGTGGC GATAAGTCGT GTCTTACCGG
5221 GTTGACTCA AGACGATAGT TACCGGATAA GGCGCAGCGG TCGGGCTGAA CGGGGGGTTC
5281 GTGCACACAG CCCAGCTTGG AGCGAACGAC CTACACCGAA CTGAGATACC TACAGCGTGA
5341 GCTATGAGAA AGCGCCACGC TTCCCGAAGG GAGAAAGGCG GACAGGTATC CGGTAAGCGG
5401 CAGGGTCGGA ACAGGAGAGC GCACGAGGGA GCTTCCAGGG GGAAACGCCT GGTATCTTTA
5461 TAGTCCTGTC GGGTTTCGCC ACCTCTGACT TGAGCGTCGA TTTTGTGAT GCTCGTCAGG
5521 GGGGCGGAGC CTATGGAAAA ACGCCAGCAA CGCGGCCCTT TTACGGTTCC TGGCCTTTTG
5581 CTGGCCTTTT GCTCACATGT TCTTTCCTGC GTTATCCCCT GATTCTGTGG ATAACCGTAT
5641 TACCGCCTTT GAGTGAGCTG ATACCGCTCG CCGCAGCCGA ACGACCGAGC GCAGCGAGTC
5701 AGTGCGGAG GAAGCGGAAG AGCGCTGAT GCGGTATTTT CTCCTTACGC ATCTGTGCGG
5761 TATTTACACAC CGCATAATTT TGTAAAATTT CCGGTAAAT TTTTGTAAAT TCAGTCTATT
5821 TTTTAAACCA TAGGCCGAAA TCGGCAAAAT CCTTATAAAA TCAAAAGAAT AGACCGAGAT
5881 AGGGTTGAGT GTTGTTCAG TTTGGAACAA GAGTCCACTA TTAAAGAACG TGGACTCCAA
5941 CGTCAAAGGG CGAAAAACCG TCTATCAGGG CGATGGCCCA CTACGTGAAC CATCACCTTA
6001 ATCAAGTTTT TTGGGGTCGA GGTGCCGTAA AGCACTAAAT CGGAACCCTA AAGGGAGCCC-

FIGURE 24C

6061 CCGATTTAGA GCTTGACGGG GAAAGCCGGC GAACGTGGCG AGAAAGGAAG GGAAGAAAGC
 6121 GAAAGGAGCG GGCGCTAGGG CGCTGGCAAG TGTAGCGGTC ACGCTGCGCG TAACCACCAC
 6181 ACCCGCCGCG CTTAATGCGC CGCTACAGGG CGCGTCCATT CGCCATTCAG GCTGCTATGG
 6241 TGCACTCTCA GTACAATCTG CTCTGATGCC GCATAGTTAA GCCAGTATAC ACTCCGCTAT
 6301 CGCTACGTGA CTGGGTCATG GCTGCGCCCC GACACCCGCC AACACCCGCT GACGCGCCCT
 6361 GACGGGCTTG TCTGCTCCCG GCATCCGCTT ACAGACAAGC TGTGACCGTC TCCGGGAGCT
 6421 GCATGTGTCA GAGGTTTTCA CCGTCATCAC CGAAACGCGC GAGGCAGCAG ATCAATTCGC
 6481 GCGCGAAGGC GAAGCGGCAT GCATTTACGT TGACACCATC GAATGGTGCA AAACCTTTCG
 6541 CGGTATGGCA TGATAGCGCC CGGAAGAGAG TCAATTCAGG GTGGTGAATG TGAAACCAGT
 6601 AACGTTATAC GATGTCGCAG AGTATGCCGG TGTCTCTTAT CAGACCGTTT CCCGCGTGGT
 6661 GAACCAGGCC AGCCACGTTT CTGCGAAAAC GCGGGAAAAA GTGGAAGCGG CGATGGCGGA
 6721 GCTGAATTAC ATTCCCAACC GCGTGGCACA ACAACTGGCG GGCAAACAGT CGTTGCTGAT
 6781 TGGCGTTGCC ACCTCCAGTC TGGCCCTGCA CGCGCCGTCG CAAATTGTCG CGGCGATTAA
 6841 ATCTCGCGCC GATCAACTGG GTGCCAGCGT GGTGGTGTCG ATGGTAGAAC GAAGCGGCGT
 6901 CGAAGCCTGT AAAGCGGCGG TGCACAATCT TCTCGCGCAA CGCGTCAGTN GGGCTGATCA
 6961 TTAA

003050 03421650

FIGURE 24b

PD EST 5

**pSPORT '+' (for sequencing, probes,
phagemid)**

1. agg cac ccc agg **-35** lac promoter **-10** lac RNA
tcc gtg ggg tcc gat tac act tta tgc ttc cgg ctg gtc tgt tga gtg gaa
 gaa atg tpa aat acg aag gcc gag cat aca caa cac ctt

(Note: In the original image, boxes are drawn around -35/gat-tac-act and -10/gtc-tgt-tga.)

"reverse" sequencing primers

52 ttg tga gcg gat aac aat ttc aca cag gaa aca gct ^{α-peptide} atg acc atg att acg
aac act cgc cta ttg tta aag tgt gtc ctt tgt cga tac tgg tac taa tgc

103 cca agc tct aat acg act cac tat agg gaa agc tgg tac gcc tgc ^{Pst}agg tac
ggt tcg aga tta tgc tga gtg ata tcc att tcg acc atg cgg ^{Kpn}acg tct atg

154

	<u>EcoRI</u>										<u>Sma</u>	<u>Sal</u>				<u>Int</u>	<u>HindIII</u>
	cgg	tcc	gga	att	ccc	ggg	tcc	acg	atc	aca	agt	tgg	tac	aaa	aaa	gct	gaa
	gcc	agg	cct	taa	ggg	ccc	agc	tgc	tag	tgt	tca	aac	atg	ttt	ttt	cga	gtt

↓ Gene

1990

Int α TR2 Spe

~~ttt acg ttt ctc gtt cag ctc tct tgt aca aag tgg tga tca cta gtc ggc~~
~~aaa tgc aaa gag caa gtc gaa aga aca tgt ttc acc act agt gat cag ccg~~

2041 ^{Not} ggc cgc ^{Xba} tct aga ^{Bam} gga tcc ^{Hind3} atg ctt ^{Mlu} tac gcg ^{Sph} tgc atg cga cgt cat agc
ccg gcg aga tgt cct agg ttc gaa tgc atg cgc acg tac gct gca gta tcg

2092 tct tct ata gtg tca cct aaa ttc aat tca ctg gcc gtc gtt tta caa cgt
aga aga tat cac agt gga ttt aag tta agt gac cgg cag caa aat gtt gca

SP6 promoter

SP6 RNA

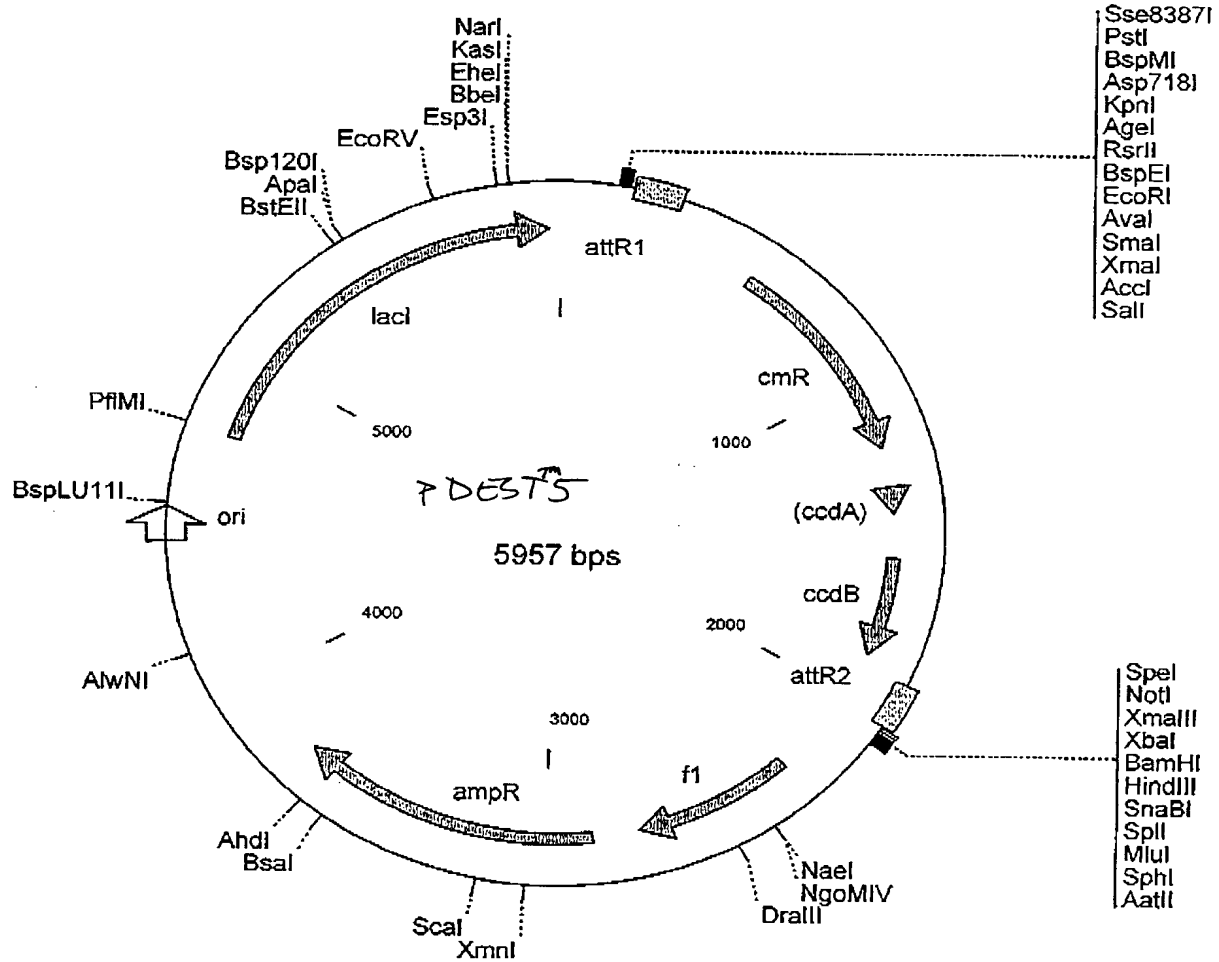
"forward sequencing

2143 cgt gac tgg gaa aac cct ggc gtt acc caa ctt aat cgc ctt gca gca cat
gca ctg acc ctt ttg gga ccg gaa tgg gtt gaa tta gcg gaa cgt cgt gta
...primers

Figure 25B

7 DEST5

(cont'd)



pDEST5 5957 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
305..181	attR1
555..1214	CmR
1334..1418	inactivated ccdA
1556..1861	ccdB
1902..2026	attR2
2278..2733	f1 (f1 intergenic region)
2865..3722	ampR
5378..5538	ori
4756..5922	lacI

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1 AGGCACCCCA GGCTTTACAC TTTATGCTTC CGGCTCGTAT GTTGTGTGGA ATTGTGAGCG
61 GATAACAATT TCACACAGGA AACAGCTATG ACCATGATTA CGCCAAGCTC TAATACGACT
121 CACTATAGGG AAAGCTGGTA CGCCTGCAGG TACCGGTCCG GAATTCCTGG GTGACGATC
181 ACAAGTTTGT AAAAAAAGC TGAACGAGAA ACGTAAATG ATATAAATAT CAATATATTA
241 AATTAGATTT TGCATAAAAA ACAGACTACA TAATACTGTA AAACACAACA TATCCAGTCA
301 CTATGGCGGC CGCTAAGTTG GCAGCATCAC CCGACGCACT TTGCGCCGAA TAAATACCTG
361 TGACGGAAGA TCACTTCGCA GAATAAATAA ATCCTGGTGT CCCTGTTGAT ACCGGGAAGC
421 CCTGGGCCAA CTTTTGGCGA AAATGAGACG TTGATCGGCA CGTAAGAGGT TCCAACTTTC
481 ACCATAATGA AATAAGATCA CTACCGGGCG TATTTTTTGA GTTATCGAGA TTTTCAGGAG
541 CTAAGGAAGC TAAAATGGAG AAAAAATCA CTGGATATAC CACCGTTGAT ATATCCCAAT
601 GGCATCGTAA AGAACATTTT GAGGCATTTT AGTCAGTTGC TCAATGTACC TATAACCAGA
661 CCGTTCAGCT GGATATTACG GCCTTTTAA AGACCGTAAA GAAAAATAAG CACAAGTTTT
721 ATCCGGCCTT TATTCACATT CTGCCCCGCC TGATGAATGC TCATCCGGAA TTCCGTATGG
781 CAATGAAAGA CGGTGAGCTG GTGATATGGG ATAGTGTTCA CCCTTGTTAC ACCGTTTTTC
841 ATGAGCAAAC TGAAACGTTT TCATCGCTCT GGAGTGAATA CCACGACGAT TTCCGGCAGT
901 TTCTACACAT ATATTGCAA GATGTGGCGT GTTACGGTGA AAACCTGGCC TATTTCCCTA
961 AAGGGTTTAT TGAGAATATG TTTTTCGTCT CAGCCAATCC CTGGGTGAGT TTCACCAGTT
1021 TTGATTTAAA CGTGCCCAAT ATGGACAAC TCTTCGCCCC CGTTTTCCACC ATGGGCAAAT
1081 ATTATACGCA AGGCGACAAG GTGCTGATGC CGCTGGCGAT TCAGGTTTAT CATGCCGTCT
1141 GTGATGGCTT CCATGTCGGC AGAATGCTTA ATGAATTACA ACAGTACTGC GATGAGTGGC
1201 AGGGCGGGGC GTAAACGCGT GGATCCGGCT TACTAAAAGC CAGATAACAG TATGCGTATT
1261 TGCGCGCTGA TTTTTCGGT ATAAGAATAT ATACTGATAT GTATACCCGA AGTATGTCAA
1321 AAAGAGGTGT GCTATGAAGC AGCGTATTAC AGTGACAGTT GACAGCGACA GCTATCAGTT
1381 GCTCAAGGCA TATATGATGT CAATATCTCC GGTCTGGTAA GCACAACCAT GCAGAAATGAA
1441 GCGCGTCGTC TGCGTGCCGA ACGCTGGAAA GCGGAAAATC AGGAAGGGAT GGCTGAGGTC
1501 GCGCGGTTTA TTGAAATGAA CGGCTCTTTT GCTGACGAGA ACAGGGACTG GTGAAATGCA
1561 GTTTAAGGTT TACACCTATA AAAGAGAGAG CCGTTATCGT CTGTTTGTGG ATGTACAGAG
1621 TGATATTATT GACACGCCC GCGACGGAT GGTGATCCCC CTGGCCAGTG CACGTCTGCT
1681 GTCAGATAAA GTCTCCCGTG AACTTTACCC GGTGGTGCAT ATCGGGGATG AAAGCTGGCG
1741 CATGATGACC ACCGATATGG CCAGTGTGCC GGTCTCCGTT ATCGGGGAAG AAGTGGCTGA
1801 TCTCAGCCAC CGCGAAAATG ACATCAAAAA CGCCATTAAC CTGATGTTCT GGGGAATATA
1861 AATGTCAGGC TCCCTTATAC ACAGCCAGTC TGCAGGTCGA CCATAGTGAC TGGATATGTT
1921 GTGTTTTACA GTATTATGTA GTCTGTTTTT TATGCAAAAT CTAATTTAAT ATATTGATAT
1981 TTATATCATT TTACGTTTCT CGTTCAGCTT TCTTGTAACA AGTGGTGATC ACTAGTCGGC
2041 GGCCGCTCTA GAGGATCCAA GCTTACGTAC GCGTGCATGC GACGTCATAG CTCTTCTATA
2101 GTGTACCTA AATTCAATTC ACTGGCCGTC GTTTTACAAC GTCGTGACTG GGAAAACCTT
2161 GGCGTTACCC AACTTAATCG CTTGTCAGCA CATCCCCCTT TCGCCAGCTG GCGTAATAGC
2221 GAAGAGGCCC GCACCGATCG CCTTCCCAA CAGTTGCGCA GCCTGAATGG CGAATGGACG
2281 CGCCCTGTAG CGGCGCATTA AGCGCGGCGG GTGTGGTGGT TACGCGCAGC GTGACCGCTA
2341 CACTTGCCAG CGCCCTAGCG CCCGCTCCTT TCGCTTTCTT CCCTTCCTTT CTCGCCACGT
2401 TCGCCGGCTT TCCCGTCAA GCTCTAAATC GGGGGCTCCC TTTAGGGTTC CGATTTAGTG
2461 CTTTACGGCA CCTCGACCCC AAAAAATTTG ATTAGGGTGA TGGTTACGCT AGTGGGCCAT
2521 CGCCCTGATA GACGGTTTTT CGCCCTTTGA CGTTGGAGTC CACGTTCTTT AATAGTGGAC
2581 TCTTGTTCCT AACTGGAACA AACTCAACC CTATCTCGGT CTATTCTTTT GATTTATAAG-

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FIGURE 25C

2641 GGATTTTGGC GATTTCGGCC TATTGGTTAA AAAATGAGCT GATTTAACAA AAATTTAACG
2701 CGAATTTTAA CAAAATATTA ACGTTTACAA TTTCAGGTGG CACTTTTCGG GGAAATGTGC
2761 GCGGAACCCC TATTTGTTTA TTTTCTAAA TACATTCAA TATGTATCCG CTCATGAGAC
2821 AATAACCCTG ATAAATGCTT CAATAATATT GAAAAAGGAA GAGTATGAGT ATTCACATT
2881 TCCGTGTCGC CCTTATTCCT TTTTTCGGG CATTTTGCCT TCCTGTTTTT GCTCACCCAG
2941 AAACGCTGGT GAAAGTAAAA GATGCTGAAG ATCAGTTGGG TGCACGAGTG GGTACATCG
3001 AACTGGATCT CAACAGCGGT AAGATCCTTG AGAGTTTTTCG CCCCGAAGAA CGTTTTCCAA
3061 TGATGAGCAC TTTTAAAGTT CTGCTATGTG GCGCGGTATT ATCCCGTATT GACGCCGGGC
3121 AAGAGCAACT CGGTCGCCGC ATACACTATT CTCAGAATGA CTTGGTTGAG TACTCACCAG
3181 TCACAGAAAA GCATCTTACG GATGGCATGA CAGTAAGAGA ATTATGCAGT GCTGCCATAA
3241 CCATGAGTGA TAACACTGCG GCCAACTTAC TTCTGACAAC GATCGGAGGA CCGAAGGAGC
3301 TAACCGCTTT TTTGCACAAC ATGGGGGATC ATGTAAGTTCG CCTTGATCGT TGGGAACCGG
3361 AGCTGAATGA AGCCATACCA AACGACGAGC GTGACACCAC GATGCCTGTA GCAATGGCAA
3421 CAACGTTGCG CAACTATTA ACTGGCGAAC TACTTACTCT AGCTTCCCGG CAACAATTAA
3481 TAGACTGGAT GGAGGCGGAT AAAGTTGCAG GACCACTTCT GCGCTCGGCC CTTCCGGCTG
3541 GCTGGTTTAT TGCTGATAAA TCTGGAGCCG GTGAGCGTGG GTCTCGCGGT ATCATTTGCAG
3601 CACTGGGGCC AGATGGTAAG CCCTCCCGTA TCGTAGTTAT CTACACGACG GGGAGTCAGG
3661 CAACTATGGA TGAACGAAAT AGACAGATCG CTGAGATAGG TGCCCTACTG ATTAAGCATT
3721 GGTAAGTGTG AGACCAAGTT TACTCATATA TACTTTAGAT TGATTTAAAA CTTCACTTTT
3781 AATTTAAAAA GATCTAGGTG AAGATCCTTT TTGATAATCT CATGACCAA ATCCCTTAAC
3841 GTGAGTTTTT GTTCCACTGA GCGTCGAGCC CCGTAGAAAA GATCAAAAGGA TCTTCTTGAG
3901 ATCCTTTTTT TCTGCGCGTA ATCTGCTGCT TGCAAACAAA AAAACCACCG CTACCAGCGG
3961 TGGTTTGTGT GCCGGATCAA GAGCTACCAA CTCTTTTTTCC GAAGGTAAGT GGCTTCAGCA
4021 GAGCGCAGAT ACCAAATACT GTCCTTCTAG TGTAAGCCGT GTTAGGCCAC CACTTCAAGA
4081 ACTCTGTAGC ACCGCCTACA TACCTCGCTC TGCTAATCCT GTTACCAGTG GCTGCTGCCA
4141 GTGGCGATAA GTCGTGTCTT ACCGGGTTGG ACTCAAGACG ATAGTTACCG GATAAGGCGC
4201 AGCGGTCGGG CTGAACGGGG GGTTCGTGCA CACAGCCCAG CTTGGAGCGA ACGACCTACA
4261 CCGAACTGAG ATACCTACAG CGTGAGCATT GAGAAAGCGC CACGCTTCCC GAAGGGAGAA
4321 AGGCGGACAG GTATCCGGTA AGCGGCAGGG TCGGAACAGG AGAGCGCACG AGGGAGCTTC
4381 CAGGGGGAAG CGCCTGGTAT CTTTATAGTC CTGTCGGGTT TCGCCACCTC TGAATTGAGC
4441 GTCGATTTTT GTGATGCTCG TCAGGGGGGC GGAGCCTATG GAAAAACGCC AGCAACGCGG
4501 CCTTTTTTACG GTTCTCTGGC TTTTGCTGGC CTTTGTCTCA CATGTTCTTT CTTGCGTTAT
4561 CCCCTGATTC TGTGGATAAC CGTATTACCG CCTTTGAGTG AGCTGATACC GCTCGCCGCA
4621 GCCGAACGAC CGAGCGCAGC GAGTCAGTGA GCGAGGAAGC GGAAGAGCGC CCAATACGCA
4681 AACCCTCTCT CCCCCTGGCGT TGGCCGATTC ATTAATGCAG AGCTTGCAAT TCGCGCGCGA
4741 AGGCGAAGCG GCATTACGT TGACACCATC GAATGGCGCA AAACCTTTTCG CCGTATGGCA
4801 TGATAGCGCC CGAAGAGAG TCAATTCAGG GTGGTGAATG TGAAACAGT AACGTTATAC
4861 GATGTCGCAG AGTATGCCGG TGTCTCTTAT CAGACCGTTT CCCGCGTGGT GAACCAGGCC
4921 AGCCACGTTT CTGCGAAAAA GCGGGAAAAA GTGGAAGCGG CGATGGCGGA GCTGAATTAC
4981 ATTCCCAACC GCGTGGCACA ACAACTGGCG GGCAAACAGT CGTTGCTGAT TGGCGTTGCC
5041 ACCTCCAGTC TGGCCCTGCA CGCGCCGTCG CAAATTGTCG CGGCGATTAA ATCTCGCGCC
5101 GATCAACTGG GTGCCAGCGT GGTGGTGTG ATGGTAGAAC GAAGCGGCGT CGAAGCCTGT
5161 AAAGCGGCGG TGCACAATCT TCTCGCGCAA CGGGTCAGTG GGCTGATCAT TAACTATCCG
5221 CTGGATGACC AGGATGCCAT TGCTGTGGAA GCTGCCTGCA CTAATGTTCC GGCCTTATTT
5281 CTTGATGTCT CTGACCAGAC ACCCATCAAC AGTATTATTT TCTCCCATGA AGACGGTACG
5341 CGACTGGGCG TGGAGCATCT GGTCGCATTG GGTCACCAGC AAATCGCGCT GTTAGCGGGC
5401 CCATTAAGTT CTGTCTCGGC GCGTCTGCGT CTGGCTGGCT GGCATAAATA TCTACTCGC
5461 AATCAAATTC AGCCGATAGC GGAACGGGAA GGCAGCTGGA GTGCCATGTC CGGTTTTCAA
5521 CAAACCATGC AAATGCTGAA TGAGGGCATC GTTCCCACTG CGATGCTGGT TGCCAACGAT
5581 CAGATGGCGC TGGGCGCAAT GCGCGCCAT ACCGAGTCCG GGCTGCGCGT TGGTCCGAT
5641 ATCTCGGTAG TGGGATACGA CGATACCGAA GACAGCTCAT GTTATATCCC CCGGTGCAAC
5701 ACCATCAAAC AGGATTTTCG CTGCTGGGG CAAACAGCG TGGACCGCTT GCTGCAACTC
5761 TCTCAGGGCC AGGCGGTGAA GGGCAATCAG CTGTTGCCCC TCTCACTGGT GAAAAGAAAA
5821 ACCACCCTGG CGCCCAATAC GCAAACCGCC TCTCCCGCG CGTTGGCCGA TTCATTAATG
5881 CAGCTGGCAC GACAGGTTTC CCGACTGGAA AGCGGGCAGT GAGCGCAACG CAATTAATGT
5941 GAGTTAGCTC ACTCATT

FIGURE 25D

Figure 26A

pDEST6

pSPORT " (opposite strand)

"forward" sequencing primers

1 taa cgc cag ggt ttt ccc agt cac gac gtt gta aaa cga cgg cca gtg aat
att gcg gtc cca aaa ggg tca gtg ctg caa cat ttt gct gcc ggt cac tta

52 tga att tag gtg aca cta tag aag agc tat gac gtc gca tgt acg cgt acg
act tta atc cac tgt gat atc ttc tcg ata ctg cag ggt acg tgc gca tgc

SP6 promoter Sph Mlu

103 tta gct tgg atc ctc tag agc ggc cgc cga cta gtg atc aca agt tgg taa
att cga acc tag gag atc tcg ccg ggc gct gat gac tag tgt tca aac atg

Hind3 Bam Xba Not Spe Xba1 Int

154 aaa daa gct gaa cga gaa acg taa aat gat ata aat atc aat ata tta aat
ttt tct cga ctt gct ctt tgc att tta cta tat tta tag tta tat aat tta

Gene

1939 tat tta tat tat ttt acg ttt ctc gtt tag cct tct tgt aca aag tgg tga
ata aat ata gta aaa tgc aaa gag gaa gtc gaa aga gca tgt ttc acc att

Int attR2

1990 tcg tcg acc cgg gaa ttc cgg acc ggt agc tgc agg cgt acc agc ttt ccc
agc agc tgg gcc ctt aag gcc tgg dca tgg acg tcc gca tgg tgc aaa ggg

Sal Sma EcoRI Kpn Pst

T7 RNA

2041 tat agt gag tgg tat tag agc ttg gcg taa tca tgg tca tag ctg ttt cct
ata tca ctc agc ata atc tcg aac cgc att agt acc agt atc gac aaa gga

T7 promoter α-peptide "reverse ..

2092 gtg tga aat tgt tat ccg ctc aca att cca cac aac ata cga gct gga agc
cac act tta aca ata ggc gag tgt taa ggt gtg tgt tat gct cgg cct tgc

... sequencing primers lac RNA

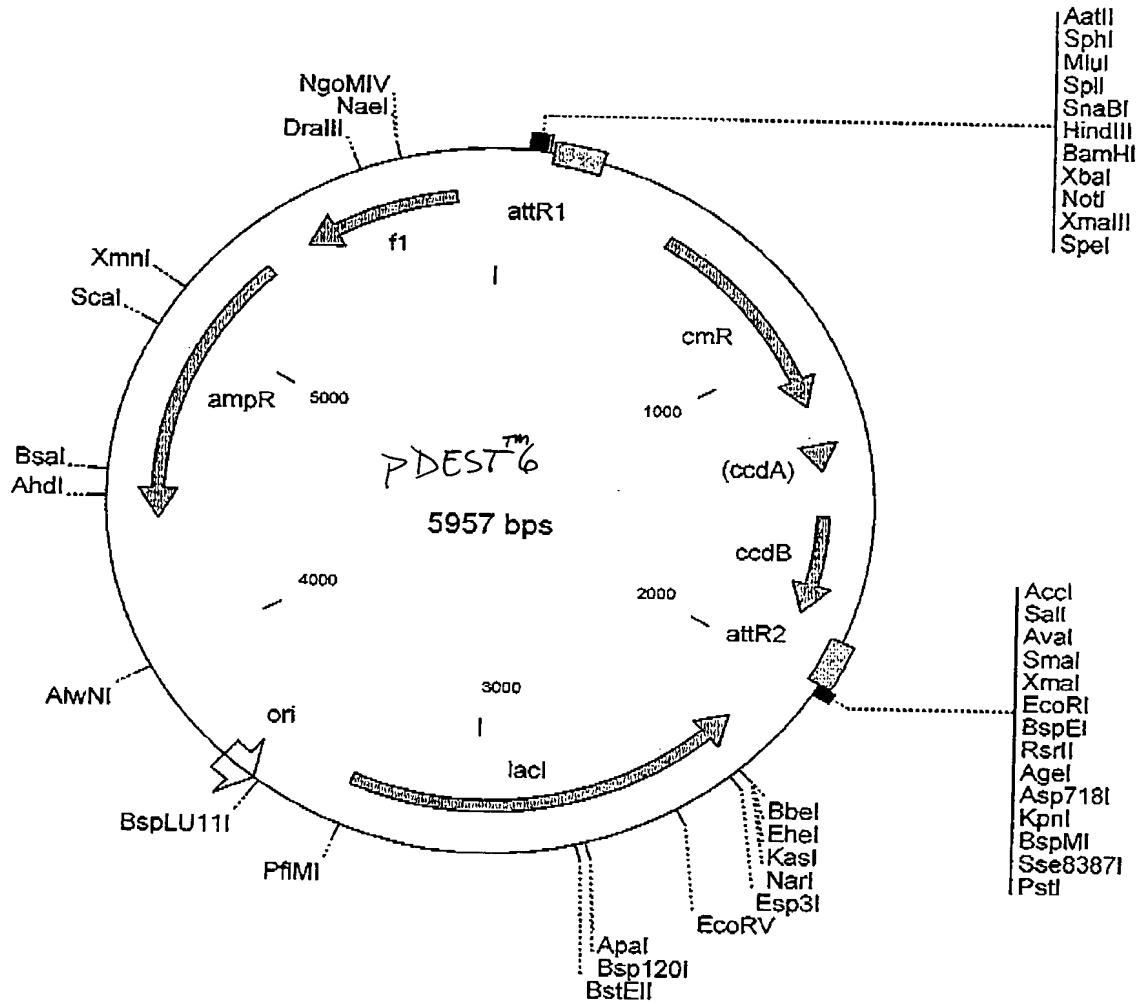
2143 ata aag tgt aaa gcc tgg ggt gcc taa tga gtg agc taa ctc aca tta att
tat ttc aca ttt cgg acc cca cgg att act cac tgc att gag tgt aat taa

-35

Figure 26B

PDEST6

(cont'd)



pDEST6 5957 bp

Location (Base Nos.)	Gene Encoded
266..142	attR1
516..1175	CmR
1295..1379	inactivated ccdA
1517..1822	ccdB
1863..1987	attR2
2203..3369	lacI
4403..5260	ampR
5392..5847	f1 (f1 intergenic region)

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1 TAACGCCAGG GTTTTCCCAG TCACGACGTT GTAAAACGAC GGCCAGTGAA TTGAATTTAG
61 GTGACACTAT AGAAGAGCTA TGACGTCGCA TGCACGCGTA CGTAAGCTTG GATCCTCTAG
121 AGCGGCCGCC GACTAGTGAT CACAAGTTTG TACAAAAAAG CTGAACGAGA AACGTAAAAT
181 GATATAAATA TCAATATATT AAATTAGATT TTGCATAAAA AACAGACTAC ATAATACTGT
241 AAAACACAAC ATATCCAGTC ACTATGGCGG CCGCTAAGTT GGCAGCATCA CCCGACGCAC
301 TTTGCGCCGA ATAAATACCT GTGACGGAAG ATCACTTCGC AGAATAAATA AATCCTGGTG
361 TCCCTGTTGA TACCGGGAAG CCCTGGGCCA ACTTTTGGCG AAAATGAGAC GTTGATCGGC
421 ACGTAAGAGG TTCCAACCTT CACCATAATG AAATAAGATC ACTACCGGGC GTATTTTTTTG
481 AGTTATCGAG ATTTTCAGGA GCTAAGGAAG CTAAAATGGA GAAAAAATC ACTGGATATA
541 CCACCGTTGA TATATCCCAA TGGCATCGTA AAGAACATTT TGAGGCATTT CAGTCAGTTG
601 CTCAATGTAC CTATAACCAG ACCGTTTCAGC TGGATATTAC GGCCTTTTTT AAGACCGTAA
661 AGAAAAATAA GCACAAGTTT TATCCGGCCT TTATTCACAT TCTTGCCCCG CTGATGAATG
721 CTCATCCGGA ATTCCGTATG GCAATGAAAG ACGGTGAGCT GGTGATATGG GATAGTGTTC
781 ACCCTTGTTA CACCGTTTTT CATGAGCAAA CTGAAACGTT TTCATCGCTC TGGAGTGAAT
841 ACCACGACGA TTTCCGGCAG TTTCTACACA TATATTCGCA AGATGTGGCG TGTTACGGTG
901 AAAACCTGGC CTATTTCCCT AAAGGGTTTA TTGAGAATAT GTTTTTTCGTC TCAGCCAATC
961 CCTGGGTGAG TTTCCACAGT TTTGATTTAA ACGTGGCCAA TATGGACAAC TTCTTCGCCC
1021 CCGTTTTTCAC CATGGGCAAA TATTATACGC AAGGCGACAA GGTGCTGATG CCGCTGGCGA
1081 TTCAGGTTCA TCATGCCGTC TGTGATGGCT TCCATGTCGG CAGAATGCTT AATGAATTAC
1141 AACAGTACTG CGATGAGTGG CAGGGCGGGG CGTAAACGCG TGGATCCGGC TFACTAAAAG
1201 CCAGATAACA GTATGCGTAT TTGCGCGCTG ATTTTTCGGG TATAAGAATA TATACTGATA
1261 TGTATACCCG AAGTATGTCA AAAAGAGGTG TGCTATGAAG CAGCGTATTA CAGTGACAGT
1321 TGACAGCGAC AGCTATCAGT TGCTCAAGGC ATATATGATG TCAATATCTC CGGTCTGGTA
1381 AGCACAACCA TGCAGAATGA AGCCCGTCGT CTGCGTGCCG AACGCTGGAA AGCGGAAAAT
1441 CAGGAAGGGA TGGCTGAGGT CGCCCGGTTT ATTGAAATGA ACGGCTCTTT TGCTGACGAG
1501 AACAGGGACT GGTGAAATGC AGTTTAAAGT TTACACCTAT AAAAGAGAGA GCCGTTATCG
1561 TCTGTTTGTG GATGTACAGA GTGATATTAT TGACACGCC GGGCGACGGA TGGTGATCCC
1621 CCTGGCCAGT GCACGTCTGC TGTGATATAA AGTCTCCCGT GAACTTTACC CGGTGGTGCA
1681 TATCGGGGAT GAAAGCTGGC GCATGATGAC CACCGATATG GCCAGTGTGC CGGTCTCCGT
1741 TATCGGGGAA GAAGTGGCTG ATCTCAGCCA CCGCGAAAAT GACATCAAAA ACGCCATTAA
1801 CCTGATGTTT TGGGGAATAT AAATGTCAGG CTCCCTTATA CACAGCCAGT CTGCAGGTCG
1861 ACCATAGTGA CTGGATATGT TGTGTTTTAC AGTATTATGT AGTCTGTTTT TTATGCAAAA
1921 TCTAATTTAA TATATTGATA TTTATATCAT TTTACGTTTC TCGTTCAGCT TTCTTGATACA
1981 AAGTGGTGAT CGTCGACCCG GGAATTCGGG ACCGGTACCT GCAGGCGTAC CAGCTTTCCC
2041 TATAGTGAGT CGTATTAGAG CTTGGCGTAA TCATGGTCAT AGCTGTTTCC TGTGTGAAAT
2101 TGTTATCCGC TCACAATTCC ACACAACATA CGAGCCGGAA GCATAAAGTG TAAAGCCTGG
2161 GGTGCCTAAT GAGTGAGCTA ACTCACATTA ATTGCGTTGC GCTCACTGCG CGCTTTCCAG
2221 TCGGGAAACC TGTCGTGCCA GCTGCATTAA TGAATCGGCC AACGCGCGGG GAGAGGCGGT
2281 TTGCGTATTG GGCGCCAGGG TGGTTTTTCT TTTACCAGT GAGACGGCA ACAGCTGATT
2341 GCCCTTCACC GCCTGGCCCT GAGAGAGTTG CAGCAAGCGG TCCACGCTGG TTTGCCCCAG
2401 CAGGCGAAAA TCCTGTTTGA TGGTGTTTGA CGGCGGGATA TAACATGAGC TGTCTTCGGT
2461 ATCGTCGTAT CCCACTACCG AGATATCCGC ACCAACGCGC AGCCCGGACT CGGTAATGGC
2521 GCGCATTGCG CCCAGCGCCA TCTGATCGTT GGCAACCAGC ATCGCAGTGG GAACGATGCC
2581 CTCATTCAGC ATTTGCATGG TTTGTTGAAA ACCGGACATG GCACTCCAGT CGCCTTCCCC
2641 TTCCGCTATC GGCTGAATTT GATTGCGAGT GAGATATTTA TGCCAGCCAG CCAGACGCAG-

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FIGURE 26C

2701	ACGCGCCGAG	ACAGAACTTA	ATGGGCCCCG	TAACAGCGCG	ATTTGCTGGT	GACCCAATGC
2761	GACCAGATGC	TCCACGCCCA	GTCGCGTACC	GTCTTTCATGG	GAGAAAAATA	TACTGTTGAT
2821	GGGTGTCTGG	TCAGAGACAT	CAAGAAATAA	CGCCGGAACA	TTAGTGCAGG	CAGCTTCCAC
2881	AGCAATGGCA	TCCTGGTCAT	CCAGCGGATA	GTTAATGATC	AGCCCACTGA	CCCGTTGCGC
2941	GAGAAGATTG	TGCACCGCCG	CTTTACAGGC	TTCGACGCCG	CTTCGTTCTA	CCATCGACAC
3001	CACCACGCTG	GCACCCAGTT	GATCGGCGCG	AGATTTAATC	GCCGCGACAA	TTTGCGACGG
3061	CGCGTGCAGG	GCCAGACTGG	AGGTGGCAAC	GCCAATCAGC	AACGACTGTT	TGCCCCGCCAG
3121	TTGTTGTGCC	ACGCGGTTGG	GAATGTAATT	CAGCTCCGCC	ATCGCCGCTT	CCACTTTTTTC
3181	CCGCGTTTTTC	GCAGAAACGT	GGCTGGCCTG	GTTCACCACG	CGGGAAACGG	TCTGATAAGA
3241	GACACCGGCA	TACTCTGCGA	CATCGTATAA	CGTTACTGGT	TTCACATTCA	CCACCCTGAA
3301	TTGACTCTCT	TCCGGGCGCT	ATCATGCCAT	ACCGCGAAAG	GTTTTGCGCC	ATTCGATGGT
3361	GTCAACGTAA	ATGCCGCTTC	GCCTTCGCGC	GCGAATTGCA	AGCTCTGCAT	TAATGAATCG
3421	GCCAACGCGC	GGGGAGAGGC	GGTTTGCGTA	TTGGGCGCTC	TTCCGCTTCC	TGCGTCACTG
3481	ACTCGCTGCG	CTCGGTCTGT	CGGCTGCGGC	GAGCGGTATC	AGCTCACTCA	AAGGCGGTAA
3541	TACGGTTATC	CACAGAATCA	GGGGATAACG	CAGGAAAGAA	CATGTGAGCA	AAAGGCCAGC
3601	AAAAGGCCAG	GAACCGTAAA	AAGGCCGCGT	TGCTGGCGTT	TTTCCATAGG	CTCCGCCCCC
3661	CTGACGAGCA	TCACAAAAAT	CGACGCTCAA	GTCAGAGGTG	GCGAAACCCG	ACAGGACTAT
3721	AAAGATACCA	GGCGTTTCCC	CCTGGAAGCT	CCCTCGTGCG	CTCTCCTGTT	CCGACCCTGC
3781	CGCTTACCGG	ATACCTGTCC	GCCTTTCTCC	CTTCGGGAAG	CGTGGCGCTT	TCTCAATGCT
3841	CACGCTGTAG	GTATCTCAGT	TCGGTGTAGG	TCGTTTCGCTC	CAAGCTGGGC	TGTGTGCACG
3901	AACCCCCCGT	TCAGCCCGAC	CGCTGCGCCT	TATCCGGTAA	CTATCGTCTT	GAGTCCAACC
3961	CGGTAAGACA	CGACTTATCG	CCACTGGCAG	CAGCCACTGG	TAACAGGATT	AGCAGAGCGA
4021	GGTATGTAGG	CGGTGCTACA	GAGTTCTTGA	AGTGGTGGCC	TAACTACGGC	TACACTAGAA
4081	GGACAGTATT	TGGTATCTGC	GCTCTGCTGA	AGCCAGTTAC	CTTCGGAAAA	AGAGTTGGTA
4141	GCTCTTGATC	CGGCAAACAA	ACCACCGCTG	GTAGCGGTAG	TTTTTTTGTG	TGCAAGCAGC
4201	AGATTACGCG	CAGAAAAAAA	GGATCTCAAG	AAGATCCTTT	GATCTTTTCT	ACGGGGTCTG
4261	ACGCTCAGTG	GAACGAAAAA	TCACGTTAAG	GGATTTTGGT	CATGAGATTA	TCAAAAAGGA
4321	TCTTACCTA	GATCCTTTTA	AATTAATAAT	GAAGTTTTAA	ATCAATCTAA	AGTATATATG
4381	AGTAAACTTG	GTCTGACAGT	TACCAATGCT	TAATCAGTGA	GGCACCTATC	TCAGCGATCT
4441	GTCTATTTTC	TTCATCCATA	GTTGCCTGAC	TCCCCGTCGT	GTAGATAACT	ACGATACGGG
4501	AGGGCTTACC	ATCTGGCCCC	AGTGCTGCAA	TGATACCGCG	AGACCCACGC	TCACCGGCTC
4561	CAGATTTATC	AGCAATAAAC	CAGCCAGCCG	GAAGGGCCGA	GCGCAGAAGT	GGTCTTGCAA
4621	CTTTATCCGC	CTCCATCCAG	TCTATTAATT	GTTGCCGGGA	AGCTAGAGTA	AGTAGTTCGC
4681	CAGTTAATAG	TTTGCGCAAC	GTTGTTGCCA	TTGCTACAGG	CATCGTGGTG	TCACGCTCGT
4741	CGTTTGGTAT	GGCTTCATTC	AGCTCCGGTT	CCCAACGATC	AAGGCGAGTT	ACATGATCCC
4801	CCATGTTGTG	CAAAAAAGCG	GTTAGCTCCT	TCGGTCCTCC	GATCGTTGTC	AGAAGTAAGT
4861	TGGCCGCAGT	GTTATCACTC	ATGGTTATGG	CAGCACTGCA	TAATTCTCTT	ACTGTCATGC
4921	CATCCGTAAG	ATGCTTTTCT	GTGACTGGTG	AGTACTCAAC	CAAGTCATTC	TGAGAATAGT
4981	GTATGCGGCG	ACCGAGTTGC	TCTTGCCCGG	CGTCAATACG	GGATAATACC	GCGCCACATA
5041	GCAGAACTTT	AAAAGTGCTC	ATCATTTGGA	AACGTTCTTC	GGGGCGAAAA	CTCTCAAGGA
5101	TCTTACCCTG	GTTGAGATCC	AGTTCGATGT	AACCCACTCG	TGCACCCAAC	TGATCTTCAG
5161	CATCTTTTAC	TTTCACCAGC	GTTTCTGGGT	GAGCAAAAAC	AGGAAGGCAA	AATGCCGCAA
5221	AAAAGGGGAAT	AAGGGCGACA	CGGAAATGTT	GAATACTCAT	ACTCTTCTCT	TTTCAATATT
5281	ATTGAAGCAT	TTATCAGGGT	TATTGTCTCA	TGAGCGGATA	CATATTTGAA	TGTATTTAGA
5341	AAAATAAACA	AATAGGGGTT	CCGCGCACAT	TTCCCCGAAA	AGTGCCACCT	GAAATTGTAA
5401	ACGTTAATAT	TTTGTTAAAA	TTCGCGTTAA	ATTTTTGTTA	AATCAGCTCA	TTTTTTAACC
5461	AATAGGCCGA	AATCGGCAAA	ATCCCTTATA	AATCAAAAGA	ATAGACCGAG	ATAGGGTTGA
5521	GTGTTGTTCC	AGTTTGGAAC	AAGAGTCCAC	TATTAAAGAA	CGTGGACTCC	AACGTCAAAG
5581	GGCGAAAAAC	CGTCTATCAG	GGCGATGGCG	CACACTGTGA	ACCATCAGCC	TAATCAAGTT
5641	TTTTGGGGTTC	GAGGTGCCGT	AAAGCACTAA	ATCGGAAACC	TAAAGCGAGC	CCCCGATTTA
5701	GAGCTTGACG	GGGAAAGCCG	GCGAACGTGG	CGAGAAAGGA	AGGGAAGAAA	GCGAAAGGAG
5761	CGGGCGCTAG	GGCGCTGGCA	AGTGTAGCGG	TCACGCTGCG	CGTAACCACC	ACACCCGCCG
5821	CGCTTAATGC	GCCGCTACAG	GGCGCGTCCA	TTCGCCATTC	AGGCTGCGCA	ACTGTTGGGA
5881	AGGGCGATCG	GTGCGGGCCT	CTTCGCTATT	ACGCCAGCTG	GCGAAAGGGG	GATGTGCTGC
5941	AAGGCGATTA	AGTTGGGG				

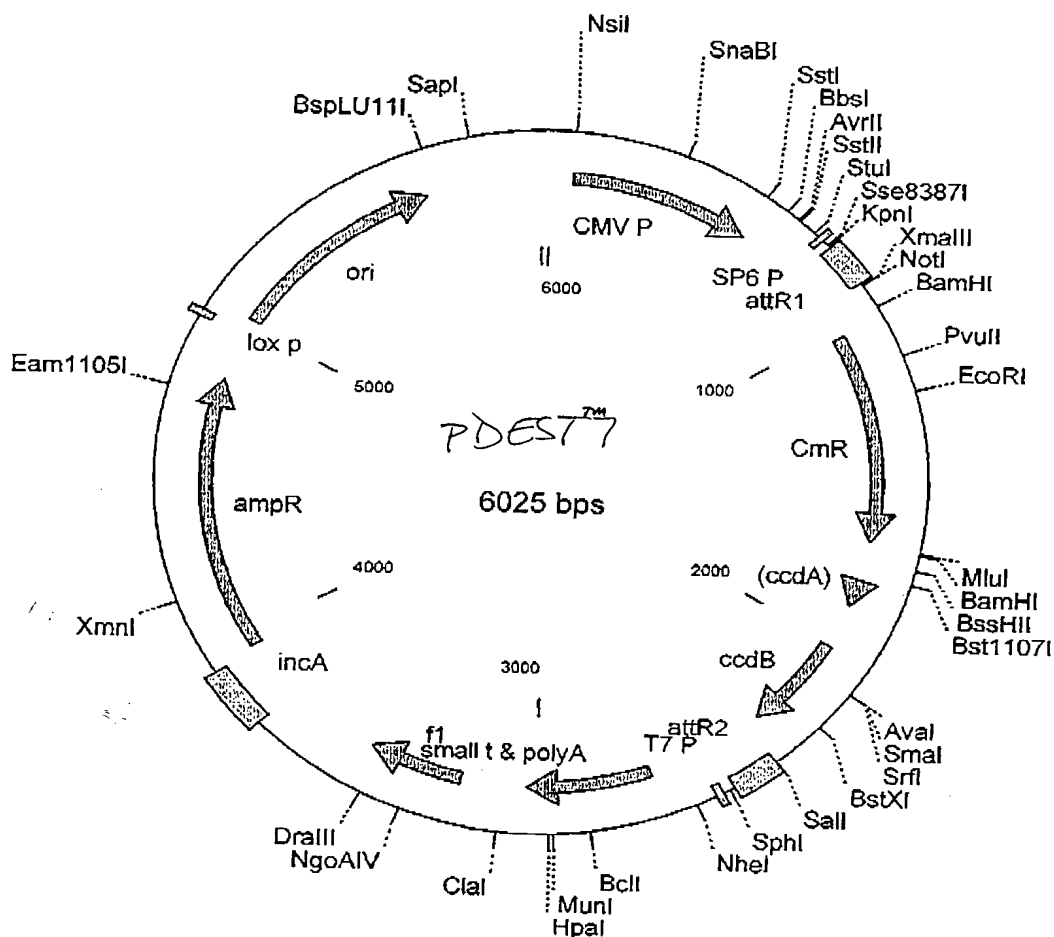
FIGURE 26D

Figure 27A: PDEST7

CMV promoter for eukaryotic expression

970 cca ttg acg caa atg ggc ggt agg cgt gta cgg tgg gag gtc tat ata agc
 ggt aac tgc gtt tac ccg cca tcc gca cat gcc acc ctc cag ata tat tcg
 1021 aga gct cgt tta gtg aac cgt cag atc gcc tgg aga cgc cat cca cgc tgt
 tct cga gca aat cac ttg gca gtc tag cgg acc tct gcg gta ggt gcg aca
 1072 ttt gac ctc cat aga aga cac cgg gac cga tcc agc ctc cgg act cta gcc
 aaa ctg gag gta tct tct gtg gcc ctg gct agg tgg gag ggc tga gat cgg
 1123 tag gcc gcg gag cgg ata aca att tca cac agg aaa cag cta tga cca cta
 atc cgg cgc ctc gcc tat tgt taa agt gtg tcc ttt gtc gat act ggt gat
 1174 ggc ttt tgc aaa aag cta ttt agg tga cac tat aga agg tac gcc tgc agg
 ccg aaa acg ttt ttc gat aaa tcc act gtg ata tct tcc atg cgg acg tct
 1225 tac cgg tcc gga att ccc atc aca agt tgg tag aca aca ggt gaa cga gaa
 atg gcc agg cct taa ggg tag tgt tca aac atg ttt ttt cga ctc gct ctc

Annotations: mRNA start (arrow at 1021), CMV enhancer/promoter (box 1072-1123), Pst (arrow 1174), EcoRI (arrow 1225), KpnI (arrow 1225), attR1 (arrow 1225), attR2 (arrow 1225).



000000" 00447F560

pDEST7 6025 bp (rotated to position 2800)

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
67..589	CMV promoter
906..782	attR1
1015..1674	CmR
1794..1878	inactivated ccdA
2016..2321	ccdB
2362..2486	attR2
2671..3033	small t & polyA
3227..3502	f1
3962..4822	ampR
5022..5661	ori

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1 ATTATCATGA CATTAACCTA TAAAAATAGG CGTAGTACGA GGCCCTTTTCA CTCATTAGAT
61 GCATGTCGTT ACATAACTTA CGGTAAATGG CCCGCCTGGC TGACCGCCCA ACGACCCCCG
121 CCCATTGACG TCAATAATGA CGTATGTTCC CATAGTAACG CCAATAGGGA CTTTCCATTG
181 ACGTCAATGG GTGGAGTATT TACGGTAAAC TGCCCCACTG GCAGTACATC AAGTGTATCA
241 TATGCCAAGT ACGCCCCCTA TTGACGTCAA TGACGGTAAA TGGCCCCGCT GGCATTATGC
301 CCAGTACATG ACCTTATGGG ACTTTCCTAC TTGGCAGTAC ATCTACGTAT TAGTCATCGC
361 TATTACCATG GTGATGCGGT TTTGGCAGTA CATCAATGGG CGTGGATAGC GGTTTGACTC
421 ACGGGGATTT CCAAGTCTCC ACCCCATTGA CGTCAATGGG AGTTTGTTTT GGCACCAAAA
481 TCAACGGGAC TTTCCAAAAT GTCGTAACAA CTCCGCCCCA TTGACGCAAA TGGGCGGTAG
541 GCGTGTACGG TGGGAGGTCT ATATAAGCAG AGCTCGTTTA GTGAACCGTC AGATCGCCTG
601 GAGACGCCAT CCACGCTGTT TTGACCTCCA TAGAAGACAC CGGGACCGAT CCAGCCTCCG
661 GACTCTAGCC TAGGCCGCGG AGCGGATAAC AATTTACAC AGGAAACAGC TATGACCATT
721 AGGCCTTTGC AAAAAGCTAT TTAGGTGACA CTATAGAAGG TACGCCTGCA GGTACCGGAT
781 CACAAGTTTG TACAAAAAAG CTGAACGAGA AACGTAAAAT GATATAAATA TCAATATATT
841 AAATTAGATT TTGCATAAAA AACAGACTAC ATAATACTGT AAAACACAAC ATATCCAGTC
901 ACTATGGCGG CCGCATTAGG CACCCAGGC TTTACACTTT ATGCTTCCGG CTCGTATAAT
961 GTGTGGATTT TGAGTTAGGA TCCGTCGAGA TTTTCAGGAG CTAAGGAAGC TAAAATGGAG
1021 AAAAAAATCA CTGGATATAC CACCGTTGAT ATATCCCAAT GGCATCGTAA AGAACATTTT
1081 GAGGCATTTT AGTCAGTTGC TCAATGTACC TATAACCAGA CCGTTCAGCT GGATATTACG
1141 GCCTTTTTTA AGACCGTAAA GAAAAATAAG CACAAGTTT ATCCGGCCTT TATTCACATT
1201 CTTGCCCCGC TGATGAATGC TCATCCGGAA TTCCGTATGG CAATGAAAGA CGGTGAGCTG
1261 GTGATATGGG ATAGTGTTCA CCCTTGTTAC ACCGTTTTCC ATGAGCAAACT TGAAACGTTT
1321 TCATCGCTCT GGAGTGAATA CCACGACGAT TTCCGCGCAGT TTCTACACAT ATATTGCAAA
1381 GATGTGGCGT GTTACGGTGA AAACCTGGCC TATTTCCCTA AAGGGTTTAT TGAGAAATATG
1441 TTTTTTCGCT CAGCCAATCC CTGGGTGAGT TTCACCAGTT TTGATTTAAA CGTGGCCAAT
1501 ATGGACAAC TCTTCGCCCC CGTTTTTCACC ATGGGCAAAT ATTATACGCA AGGCGACAAG
1561 GTGCTGATGC CGCTGGCGAT TCAGGTTTCAT CATGCCGTCT GTGATGGCTT CCATGTCGGC
1621 AGAATGCTTA ATGAATTACA ACAGTACTGC GATGAGTGGC AGGGCGGGGC GTAAACGCGT
1681 GGATCCGGCT TACTAAAAGC CAGATAACAG TATGCGTATT TGCGCGCTGA TTTTTCGGT
1741 ATAAGAATAT ATACTGATAT GTATACCCGA AGTATGTCAA AAAGAGGTGT GCTATGAAGC
1801 AGCGTATTAC AGTGACAGTT GACAGCGACA GCTATCAGTT GCTCAAGGCA TATATGATGT
1861 CAATATCTCC GGTCTGGTAA GCACAACCAT GCAGAATGAA GCGCGTCGTC TGCGTGCCGA
1921 ACGCTGGAAG GCGGAAAATC AGGAAGGGAT GGCTGAGGTC GCGCGGTTTA TTGAAATGAA
1981 CGGCTCTTTT GCTGACGAGA ACAGGGACTG GTGAAATGCA GTTTAAGGTT TACACCTATA
2041 AAAGAGAGAG CCGTTATCGT CTGTTTGTGG ATGTACAGAG TGATATTATT GACACGCCCCG
2101 GGCGACGGAT GGTGATCCCC CTGGCCAGTG CACGTCTGCT GTCAGATAAA GTCTCCCGTG
2161 AACTTTACCC GGTGGTGCAT ATCGGGGATG AAAGCTGGCG CATGATGACC ACCGATATGG
2221 CCAGTGTGCC GGTCTCCGTT ATCGGGGATG AAGTGGCTGA TCTCAGCCAC CGCGAAAATG
2281 ACATCAAAAA CGCCATTAACT CTGATGTTCT GGGGAATATA AATGTCAGGC TCCCTTATAC
2341 ACAGCCAGTC TGCAAGTTCGA CCATAGTGAC TGATATGTT GTGTTTTTACA GTATTATGTA
2401 GTCTGTTTTT TATGCAAAAT CTAATTTAAT ATATTGATAT TTATATCATT TTACGTTTCT
2461 CGTTCAGCTT TCTTGTAACA AGTGGTGATC GCGTGCATGC GACGTCATAG CTCTCTCCCT
2521 ATAGTGAGTC GTATTATAAG CTAGGCACTG GCCGTCGTTT TACAACGTCG TGACTGGGAA-

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FIGURE 27B

2581 AACTGCTAGC TTGGGATCTT TGTGAAGGAA CCTTACTTCT GTGGTGTGAC ATAATTGGAC
2641 AAACCTACCTA CAGAGATTTA AAGCTCTAAG GTAAATATAA AATTTTTTAAG TGTATAATGT
2701 GTTAAACTAG CTGCATATGC TTGCTGCTTG AGAGTTTTTG TACTTGAGTA TGATTTATGA
2761 AAATATTATA CACAGGAGCT AGTGATTCTA ATTGTTTGTG TATTTTAGAT TCACAGTCCC
2821 AAGGCTCATT TCAGGCCCCCT CAGTCCTCAC AGTCTGTTCA TGATCATAAT CAGCCATACC
2881 ACATTTGTAG AGGTTTTACT TGCTTTAAAA AACCTCCAC ACCTCCCCCT GAACCTGAAA
2941 CATAAAATGA ATGCAATTGT TGTGTTAAC TTGTTTATTG CAGCTTATAA TGGTTACAAA
3001 TAAAGCAATA GCATCACAAA TTTCACAAAT AAAGCATTTT TTTCACTGCA TTCAGTTGT
3061 GGTTCGTCCA AACTCATCAA TGTATCTTAT CATGTCTGGA TCGATCCTGC ATTAATGAAT
3121 CGGCCAACGC GCGGGGAGAG GCGGTTTGCG TATTGGCTGG CGTAATAGCG AAGAGGCCCG
3181 CACCGATCGC CTTTCCCAAC AGTTGCGCAG CCTGAATGGC GAATGGGACG CGCCCTGTAG
3241 CGGCGCATTA AGCGCGGCGG GTGTGGTGGT TACGCGCAGC GTGACCGCTA CACTTGCCAG
3301 CGCCCTAGCG CCCGCTCCTT TCGCTTTCTT CCCTTCCTTT CTCGCCACGT TCGCCGGCTT
3361 TCCCGTCAA GCTCTAAATC GGGGGCTCCC TTTAGGGTTC CGATTTAGTG CTTTACGGCA
3421 CCTCGACCCC AAAAACTTG ATTAGGGTGA TGGTTCACGT AGTGGGCCAT CGCCCTGATA
3481 GACGGTTTTT CGCCCTTTGA CGTTGGAGTC CACGTTCTTT AATAGTGGAC TCTTGTTCCTA
3541 AACTGGAACA ACACCAACC CTATCTCGGT CTATTCTTTT GATTTATAAG GGATTTTGCC
3601 GATTTCTGGCC TATTGGTTAA AAAATGAGCT GATTTAACA AAATTTAACG CGAATTTTAA
3661 CAAAAATTA ACGTTTACAA TTTCAGGTGG CACTTTTCGG GGAAATGTGC GCGGAACCCC
3721 TATTTGTTTA TTTTCTAAA TACATTCAA TATGTATCCG CTCATGCCAG GTCTTGACT
3781 GGTGAGAACG GCTTGCTCGG CAGCTTCGAT GTGTGCTGGA GGGAGAATAA AGGTCTAAGA
3841 TGTGCGATAG AGGGAAGTCG CATTGAATTA TGTGCTGTGT AGGGATCGCT GGTATCAAAT
3901 ATGTGTGCCC ACCCTGGCA TGAGACAATA ACCCTGATA ATGCTTCAAT AATATTGAAA
3961 AAGGAAGAGT ATGAGTATC AACATTTCCG TGTCGCCCTT ATTCCTTTT TTGCGGCATT
4021 TTGCCCTCCT GTTTTGTCTC ACCCAGAAAC GCTGGTGAAA GTAAAAGATG CTGAAGATCA
4081 GTTGGGTGCA CGAGTGGGTT ACATCGAAGT GGATCTCAAC AGCGGTAAGA TCCTTGAGAG
4141 TTTTCGCCCC GAAGAAGTT TTCCAATGAT GAGCACTTTT AAAAGTTCTGC TATGTGGCGC
4201 GGTATTATCC CGTATTGACG CCGGGCAAGA GCAACTCGGT CGCCGCATAC ACTATTCTCA
4261 GAATGACTTG GTTGAGTACT CACCAGTCAC AGAAAAGCAT CTTACGGATG GCATGACAGT
4321 AAGAGAATTA TGCAGTGCTG CCATAACCAT GAGTGATAAC ACTGCGGCCA ACTTACTTCT
4381 GACAACGATC GGAGGACCGA AGGAGCTAAC CGCTTTTTTG CACAACATGG GGGATCATGT
4441 AACTCGCCTT GATCGTTGGG AACCGGAGCT GAATGAAGCC ATACCAAACG ACGAGCGTGA
4501 CACCACGATG CCTGTAGCAA TGGCAACAAC GTTGCGCAAA CTATTAAGTG GCGAACTACT
4561 TACTCTAGCT TCCCGGCAAC AATTAATAGA CTGGATGGAG GCGGATAAAG TTGCAGGACC
4621 ACTTCTGCGC TCGGCCCTTC CGGCTGGCTG GTTTATTGCT GATAAATCTG GAGCCGGTGA
4681 GCGTGGGTCT CGCGGTATCA TTGCAGCACT GGGGCCAGAT GGTAAGCCCT CCCGTATCGT
4741 AGTTATCTAC ACGACGGGGA GTCAGGCAAC TATGGATGAA CGAAATAGAC AGATCGCTGA
4801 GATAGGTGCC TCACGTATTA AGCATGCTA ACTGTCAGAC CAAGTTTACT CATATATACT
4861 TTAGATTGAT TTAACACTTC ATTTTAAATT TAAAGGATC TAGGTGAAGA TCCTTTTGA
4921 TAATCTCATG CCATAACTTC GTATAATGTA TGCTATACGA AGTTATGGCA TGACCAAAAT
4981 CCTTAACGT GAGTTTTCGT TCCACTGAGC GTCAGACCCC GTAGAAAAGA TCAAAGGATC
5041 TTCTTGAGAT CTTTTTTTTT TGCGCGTAAT CTGCTGCTTG CAAACAAAAA AACCACCGCT
5101 ACCAGCGGTG GTTTGTTTGC CGGATCAAGA GCTACCAACT CTTTTTCCGA AGGTAAGTGG
5161 CTTACAGAGA GCGCAGATAC CAAATACTGT CTTCTAGTG TAGCCGTAGT TAGGCCACCA
5221 CTTCAAGAAC TCTGTAGCAC CGCCTACATA CCTCGCTCTG CTAATCCTGT TACCAGTGGC
5281 TGCTGCCAGT GGCGATAAGT CGTGTCTTAC CGGGTTGGAC TCAAGACGAT AGTTACCGGA
5341 TAAGGCGCAG CGGTCGGGCT GAACGGGGGG TTCGTGCACA CAGCCCAGCT TGGAGCGAAC
5401 GACCTACACC GAACGTAGAT ACCTACAGCG TGAGCATTGA GAAAGCGCCA CGCTTCCCGA
5461 AGGGAGAAAAG GCGGACAGGT ATCCGGTAAG CGGCAGGGTC GGAACAGGAG AGCGCACGAG
5521 GGAGCTTCCA GGGGGAACG CCTGGTATCT TTATAGTCCT GTCGGGTTTC GCCACCTCTG
5581 ACTTGAGCGT CGATTTTGTG GATGCTCGTC AGGGGGGCGG AGCCTATGGA AAAACGCCAG
5641 CAACGCGGCC TTTTACGGT TCCTGGCCTT TTGCTGGCCT TTTGCTCACA TGTCTTTTCC
5701 TCGGTTATCC CCTGATTCTG TGGATAACCG TATTACCGCC TTTGAGTGAG CTGATACCGC
5761 TCGCCGACG CGAACGACG AGCGCAGCA GTACAGTACG GAGGAAGCGG AAGAGCGCCC
5821 AATACGCAAA CCGCCTCTCC CCGCGCGTTG GCCGATTCAT TAATGCAGAG CTTGCAATTC
5881 GCGCGTTTTT CAATATTATT GAAGCATTTA TCAGGGTTAT TGTCTCATGA GCGGATACAT
5941 ATTTGAATGT ATTTAGAAAA ATAAACAAAT AGGGGTTCGG CGCACATTTT CCCGAAAAGT
6001 GCCACCTGAC GTCTAAGAAA CCATT

FIGURE 27C

Figure 28A: pDEST8 Polyhedron Promoter, Baculovirus Transfer Plasmid

Ace I

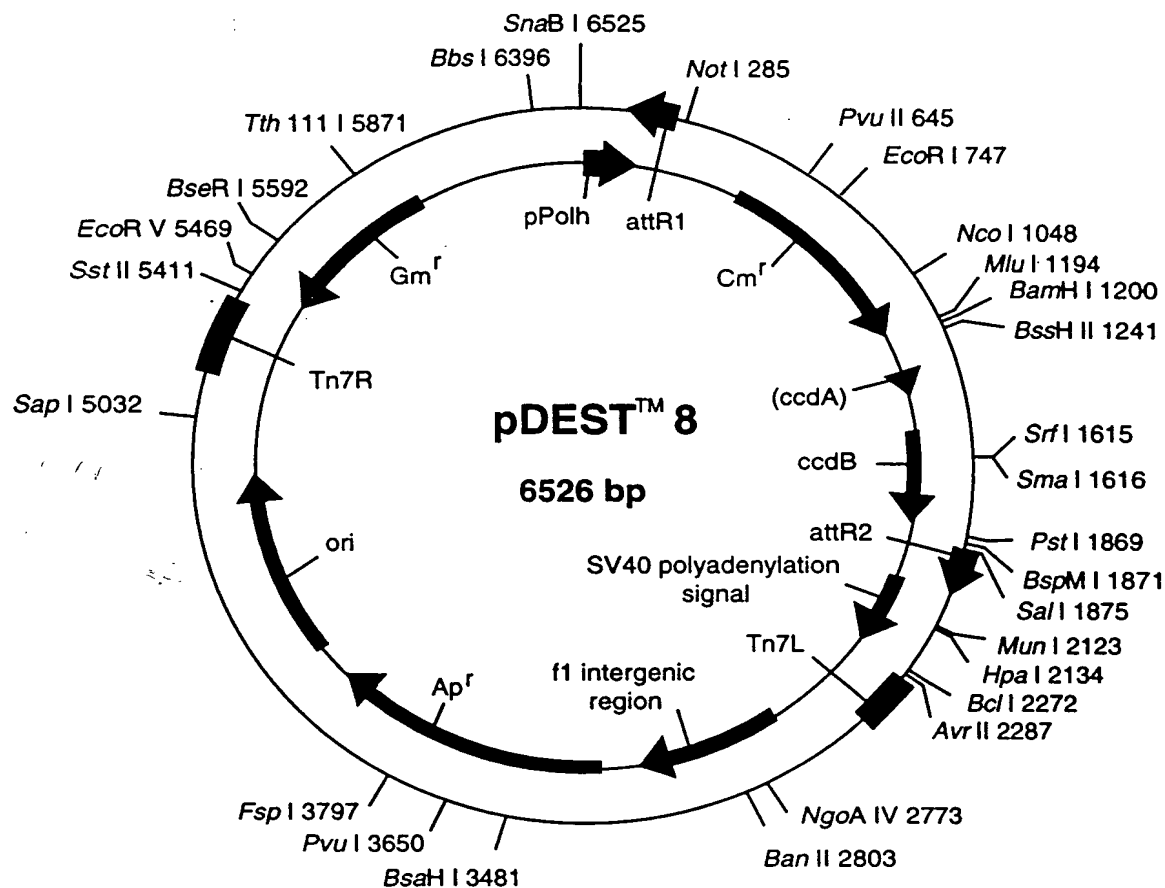
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1  cgt|ata ctc cgg aat att aat aga tca tgg aga taa tta aaa tga taa cca
   gca tat gag gcc tta taa tta tct agt acc tct att aat ttt act att ggt
52  tct cgc aaa taa ata agt att tta ctg ttt tgc taa cag ttt tgt aat aaa
   aga gcg ttt att tat tca taa aat gac aaa agc att gtc aaa aca tta ttt
103 aaa acc tat aaa tat tcc gga tta ttc ata ccg tcc cac cat cgg gcg cgg
   ttt tgg ata ttt ata agg cct aat aag tat ggc agg gtg gta gcc cgc gcc
154 atc atc aca agt tgg tag aaa aaa gct gaa cga gaa aag taa aat gat ata
   tag tag tgt tca aac atg ttt ttt cga ctt gct ctt tgc att tta cta tat
  
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mRNA (polyhedrin)

Int

AttR1



pDEST8 6526 bp

Location (Base Nos.)	Gene Encoded
23..152	Ppolh
284..160	attR1
534..1193	CmR
1313..1397	inactivated ccdA
1535..1840	ccdB
1881..2005	attR2
2766..3146	f1
3240..4090	ampR
4289..4869	ori
5564..6496	genR

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1 CGTATACTCC GGAATATTAA TAGATCATGG AGATAATTAA AATGATAACC ATCTCGCAAA
61 TAAATAAGTA TTTTACTGTT TTCGTAACAG TTTTGTAAATA AAAAAACCTA TAAATATTCC
121 GGATTATTC A TACCGTCCCA CCATCGGGCG CGGATCATCA CAAGTTTGTA CAAAAAAGCT
181 GAACGAGAAA CGTAAATGA TATAAATATC AATATATTAA ATTAGATTTT GCATAAAAAA
241 CAGACTACAT AATACTGTAA AACACAACAT ATCCAGTCAC TATGGCGGCC GCTAAGTTGG
301 CAGCATCACC CGACGCACTT TGCGCCGAAT AAATACCTGT GACGGAAGAT CACTTCGCAG
361 AATAAATAAA TCCTGGTGTC CCTGTTGATA CCGGGAAGCC CTGGGCCAAC TTTTGGCGAA
421 AATGAGACGT TGATCGGCAC GTAAGAGGTT CCAACTTTCA CCATAATGAA ATAAGATCAC
481 TACCGGGCGT ATTTTTTGAG TTATCGAGAT TTTCAGGAGC TAAGGAAGCT AAAATGGAGA
541 AAAAAATCAC TGGATATACC ACCGTTGATA TATCCCAATG GCATCGTAAA GAACATTTTG
601 AGGCATTTCA GTCAGTTGCT CAATGTACCT ATAACCAGAC CGTTCAGCTG GATATTACGG
661 CCTTTTTTAAA GACCGTAAAG AAAAAAAGC ACAAGTTTTA TCCGCGCTTT ATTCACATTC
721 TTGCCCCGCT GATGAATGCT CATCCGGAAT TCCGTATGGC AATGAAAGAC GGTGAGCTGG
781 TGATATGGGA TAGTGTTTAC CCTTGTTACA CCGTTTTTCCA TGAGCAAAC TAAACGTTTT
841 CATCGCTCTG GAGTGAATAC CACGACGATT TCCGGCAGTT TCTACACATA TATTCGCAAG
901 ATGTGGCGTG TTACGGTGAA AACCTGGCCT ATTTCCCTAA AGGGTTTATT GAGAATATGT
961 TTTTCGTCTC AGCCAATCCC TGGGTGAGTT TCACCAAGTT TGATTTAAAC GTGGCCAATA
1021 TGGACAACCT CTTGCCCCC GTTTTCACCA TGGGCAAATA TTATACGCAA GGCGACAAGG
1081 TGCTGATGCC GCTGGCGATT CAGGTTTCATC ATGCCGCTCTG TGATGGCTTC CATGTCGGCA
1141 GAATGCTTAA TGAATTACAA CAGTACTGCG ATGAGTGGCA GGGCGGGGCG TAAACGCGTG
1201 GATCCGGCTT ACTAAAAGCC AGATAACAGT ATGCGTATTT GCGCGCTGAT TTTTGCGGTA
1261 TAAGAATATA TACTGATATG TATACCCGAA GTATGTCAA AAGAGGTGTG CTATGAAGCA
1321 GCGTATTACA GTGACAGTTG ACAGCGACAG CTATCAGTTG CTCAGGCGAT ATATGATGTC
1381 AATATCTCCG GTCTGGTAAG CACAACCATG CAGAATGAAG CCCGCTGCTC GCGTGCCGAA
1441 CGCTGGAAAG CGGAAAATCA GGAAGGGATG CAGTGGGTCG CCCGTTTTAT TGAAATGAAC
1501 GGCTCTTTTG CTGACGAGAA CAGGCACTGG TGAAATGCAG TTTAAGGTTT ACACCTATAA
1561 AAGAGAGAGC CGTTATCGTC TGTGTGTGGA TGTACAGAGT GATATTATTG ACACGCCCCG
1621 GCGACGGATG GTGATCCCCC TGGCCAGTGC ACGTCTGCTG TCAGATAAAG TCTCCCGTGA
1681 ACTTTACCCG GTGGTGTCATA TCGGGGATGA AAGCTGGCGC ATGATGACCA CCGATATGGC
1741 CAGTGTGCCG GTCTCCGTTA TCGGGGAAGA AGTGGCTGAT CTCAGCCACC GCGAAAATGA
1801 CATCAAAAAC GCCATTAAAC TGATGTTCTG GGAATATAA ATGTCAGGCT CCTTTATACA
1861 CAGCCAGTCT GCAGGTCGAC CATAGTGAAT GGATATGTTG TGTTTTACAG TATTATGTAG
1921 TCTGTTTTTT ATGCAAAATC TAATTTAATA TATTGATATT TATATCATTT TACGTTTCTC
1981 GTTCAGCTTT CTGTGTACAAA GTGGTGATAG CTGTGTCGAGA AGTACTAGAG GATCATAATC
2041 AGCCATACCA CATTTGTAGA GGTTTTACTT GCTTTAAAAA ACCTCCCACT CCTCCCCCTG
2101 AACCTGAAAC ATAAAATGAA TGCAATTGTT GTTGTTAAC TGTATTATGC AGCTTATAAT
2161 GGTTACAAAT AAAGCAATAG CATCACAAT TACACAATA AAGCATTTTT TTCACTGCAT
2221 TCTAGTTGTG GTTTGTCCAA ACTCATCAAT GTATCTTATC ATGTCTGGAT CTGATCACTG
2281 CTTGAGCCTA GGAGATCCGA ACCAGATAAG TGAAATCTAG TTCCAAACTA TTTTGTCAAT
2341 TTTAATTTTC GTATTAGCTT ACGACGCTAC ACCCAGTTCC CATCTATTTT GTCACCTCTC
2401 CCTAAATAAT CCTTAAAAAC TCCATTTCCA CCCCTCCAG TTCCCAACTA TTTTGTCCGC
2461 CCACAGCGGG GCATTTTTCT TCCTGTTATG TTTTAAATCA AACATCCTGC CAACTCCATG
2521 TGACAAACCG TCATCTTCGG CTACTTTTTT TCTGTCACAG AATGAAATTT TTTCTGTCAT-

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FIGURE 28B

2581 CTCTTCGTTA TTAATGTTTG TAATTGACTG AATATCAACG CTTATTTGCA GCCTGAATGG
2641 CGAATGGACG CGCCCTGTAG CGGCGCATT AAGCGGCGG GTGTGGTGGT TACGCGCAGC
2701 GTGACCGCTA CACTTGCCAG CGCCCTAGCG CCCGCTCCTT TCGCTTTCTT CCCTTCCTTT
2761 CTCGCCACGT TCGCCGGCTT TCCCCGTCAA GCTCTAAATC GGGGGCTCCC TTTAGGGTTC
2821 CGATTTAGTG CTTTACGGCA CCTCGACCCC AAAAACTTG ATTAGGGTGA TGGTTCACGT
2881 AGTGGGCCAT CGCCCTGATA GACGGTTTTT CGCCCTTTGA CGTTGGAGTC CACGTTCTTT
2941 AATAGTGGAC TCTTGTTCCA AACTGGAACA AACTCAACC CTATCTCGGT CTATTCTTTT
3001 GATTTATAAG GGATTTTGCC GATTTTCGGC TATTGGTTAA AAAATGAGCT GATTTAACAA
3061 AAATTTAACG CGAATTTTAA CAAAATATTA ACGTTTACAA TTTCAGGTGG CACTTTTCGG
3121 GGAAATGTGC GCGGAACCCC TATTTGTTTA TTTTCTAAA TACATTCAA TATGTATCCG
3181 CTCATGAGAC AATAACCTG ATAAATGCTT CAATAATATT GAAAAAGGAA GAGTATGAGT
3241 ATTCAACATT TCCGTGTCGC CTTATTCCC TTTTTCGCG CATTTCGCCT TCCTGTTTTT
3301 GCTCACCCAG AAACGCTGGT GAAAGTAAAA GATGCTGAAG ATCAGTTGGG TGCACGAGTG
3361 GGTTACATCG AACTGGATCT CAACAGCGGT AAGATCCTTG AGAGTTTTCG CCCCAGAGAA
3421 CGTTTTTCAA TGATGAGCAC TTTTAAAGTT CTGCTATGTG GCGCGGTATT ATCCCGTATT
3481 GACGCCGGGC AAGAGCAACT CGGTGCGCGC ATACACTATT CTCAGAAATGA CTTGGTTGAG
3541 TACTCACCAG TCACAGAAAA GCATCTTACG GATGGCATGA CAGTAAGAGA ATTATGCAGT
3601 GCTGCCATAA CCATGAGTGA TAACACTGCG GCCAACTTAC TTCTGACAAC GATCGGAGGA
3661 CCGAAGGAGC TAACCGCTTT TTTGCACAAC ATGGGGGATC ATGTAACCTCG CTTGATCGT
3721 TGGGAACCGG AGCTGAATGA AGCCATACCA AACGACGAGC GTGACACCAC GATGCCTGTA
3781 GCAATGGCAA CAACGTTGCG CAAACTATTA ACTGGCGAAC TACTTACTCT AGCTTCCCGG
3841 CAACAATTAA TAGACTGGAT GGAGGCGGAT AAAGTTGCAG GACCACTTCT GCGCTCGGCC
3901 CTTCCGGCTG GCTGGTTTAT TGCTGATAAA TCTGGAGCCG GTGAGCGTGG GTCTCGCGGT
3961 ATCATTGCAG CACTGGGGCC AGATGGTAAG CCTTCCCGTA TCGTAGTTAT CTACACGACG
4021 GGGAGTCAGG CAACTATGGA TGAACGAAAT AGACAGATCG CTGAGATAGG TGCCTCACTG
4081 ATTAAGCATT GGTAACGTGC AGACCAAGTT TACTCATATA TACTTTAGAT TGATTTAAAA
4141 CTTTATTTT AATTTAAAA GATCTAGGTG AAGATCCTTT TTGATAATCT CATGACCAAA
4201 ATCCCTTAAC GTGAGTTTTT GTTCCACTGA GCGTCAGACC CCGTAGAAAA GATCAAAGGA
4261 TCTTCTTGAG ATCCTTTTTT TCTGCGCGTA ATCTGCTGCT TGCAAACAAA AAAACCACCG
4321 CTACCAGCGG TGGTTTGTTT GCCGGATCAA GAGCTACCAA CTCTTTTTTCC GAAGGTAAC
4381 GGCTTCAGCA GAGCGCAGAT ACCAAATACT GTCCTTCTAG TGTAGCCGTA GTTAGGCCAC
4441 CACTTCAAGA ACTCTGTAGC ACCGCCTACA TACCTCGCTC TGCTAATCCT GTTACCAGTG
4501 GCTGCTGCCA GTGGCGATAA GTCGTGTCTT ACCGGGTTGG ACTCAAGACG ATAGTTACCG
4561 GATAAGGCGC AGCGGTGCGG CTGAACGGGG GGTTTCGTGA CACAGCCCAG CTTGGAGCGA
4621 ACGACCTACA CCGAACTGAG ATACCTACAG CGTGAGCATT GAGAAAGCGC CACGCTTCCC
4681 GAAGGGAGAA AGGCGGACAG GTATCCGGTA AGCGGCAGGG TCGGAACAGG AGAGCGCAGC
4741 AGGGAGCTTC CAGGGGGAAG CGCCTGGTAT CTTTATAGTC CTGTGCGGTG TCGCCACCTC
4801 TGACTTGAGC GTCGATTTTT GTGATGCTCG TCAGGGGGGC GGAGCCTATG GAAAGACGCC
4861 AGCAACGCGG CCTTTTTTACG GTTCTTGCGC TTTTGCTGGC CTTTGTCTCA CTTTCTTTT
4921 CCTGCGTTAT CCCGTGATT TGTGGATAAC CGTATTACCG CCTTTGAGTG AGCTGATACC
4981 GCTCGCCGCA GCCGAACGAC CGAGCGCAGC GAGTCAGTGA GCGAGGAAGC GGAAGAGCGC
5041 CTGATGCGGT ATTTTCTCCT TACGCATCTG TGCGGTATTT CACACCGCAG ACCAGCCGCG
5101 TAACCTGGCA AAATCGGTGA CGGTTGAGTA ATAAATGGAT GCCCTGCGTA AGCGGGTGTG
5161 GGCGGACAAT AAAGTCTTAA ACTGAACAAA ATAGATCTAA ACTATGACAA TAAAGTCTTA
5221 AACTAGACAG AATAGTTGTA AACTGAAATC AGTCCAGTTA TGCTGTGAAA AAGCATACTG
5281 GACTTTTGTT ATGGCTAAAG CAAACTCTTC ATTTTCTGAA GTGCAAATTG CCCGTCGTAT
5341 TAAAGAGGGG CGTGGCCAAG GGCATGGTAA AGACTATATT CGCGGCGTTG TGACAATTTA
5401 CCGAACAACCT CCGCGGCCGG GAAGCCGATC TCGGCTTGAA CGAATTGTGA GGTGGCGGTA
5461 CTTGGGTCGA TATCAAAGTG CATCACTTCT TCCCGTATGC CCAACTTTGT ATAGAGAGCC
5521 ACTGCGGGAT CGTCACCGTA ATCTGCTTGC ACGTAGATCA CATAAGCACC AAGCGCGTTG
5581 GCCTCATGCT TGAGGAGATT GATGAGCGCG GTGGCAATGC CCTGCCTCCG GTGCTCGCCG
5641 GAGACTGCGA GATCATAGAT ATAGATCTCA CTACGCGGCT GCTCAAACCT GGCAGAACG
5701 TAAGCCGCGA GAGCGCCAAC AACCCTTCT TGGTCGAAGG CAGCAAGCGC GATGAATGTC
5761 TTACTACCGA GCAAGTTCCC GAGGTAATCG GAGTCCGGCT GATGTTGGGA GTAGGTGGCT
5821 ACTCTCCGA ACTCACGACC GAAAAGATCA AGAGCAGCCC GCATGGATTT GACTTGGTCA
5881 GGGCCGAGCC TACATGTGCG AATGATGCCC ATACTTGAGC CACCTAACTT TGTTTTAGGG
5941 CGACTGCCCT GCTGCGTAAC ATCGTTGCTG CTGCGTAACA TCGTTGCTGC TCCATAACAT
6001 CAAACATCGA CCCACGGCGT AACGCGCTTG CTGCTTGATG GCCCGAGGCA TAGACTGTAC-

FIGURE 28C

6061	AAAAAACAG	TCATAACAAG	CCATGAAAAC	CGCCACTGCG	CCGTTACCAC	CGCTGCGTTC
6121	GGTCAAGGTT	CTGGACCAGT	TGCGTGAGCG	CATACGCTAC	TTGCATTACA	GTTTACGAAC
6181	CGAACAGGCT	TATGTCAACT	GGGTTTCGTGC	CTTCATCCGT	TTCCACGGTG	TGCGTCACCC
6241	GGCAACCTTG	GGCAGCAGCG	AAGTCGAGGC	ATTTCTGTCC	TGGCTGGCGA	ACGAGCGCAA
6301	GGTTTTCGGTC	TCCACGCATC	GTCAGGCATT	GGCGGCCCTTG	CTGTTCTTCT	ACGGCAAGGT
6361	GCTGTGCACG	GATCTGCCCT	GGCTTCAGGA	GATCGGAAGA	CCTCGGCCGT	CGCGGCGCTT
6421	GCCGGTGGTG	CTGACCCCGG	ATGAAGTGGT	TCGCATCCTC	GGTTTTCTGG	AAGGCGAGCA
6481	TCGTTTGTTC	GCCCAGGACT	CTAGCTATAG	TTCTAGTGGT	TGGCTA	

[illegible]

FIGURE 28D

Figure 29A: pDEST9

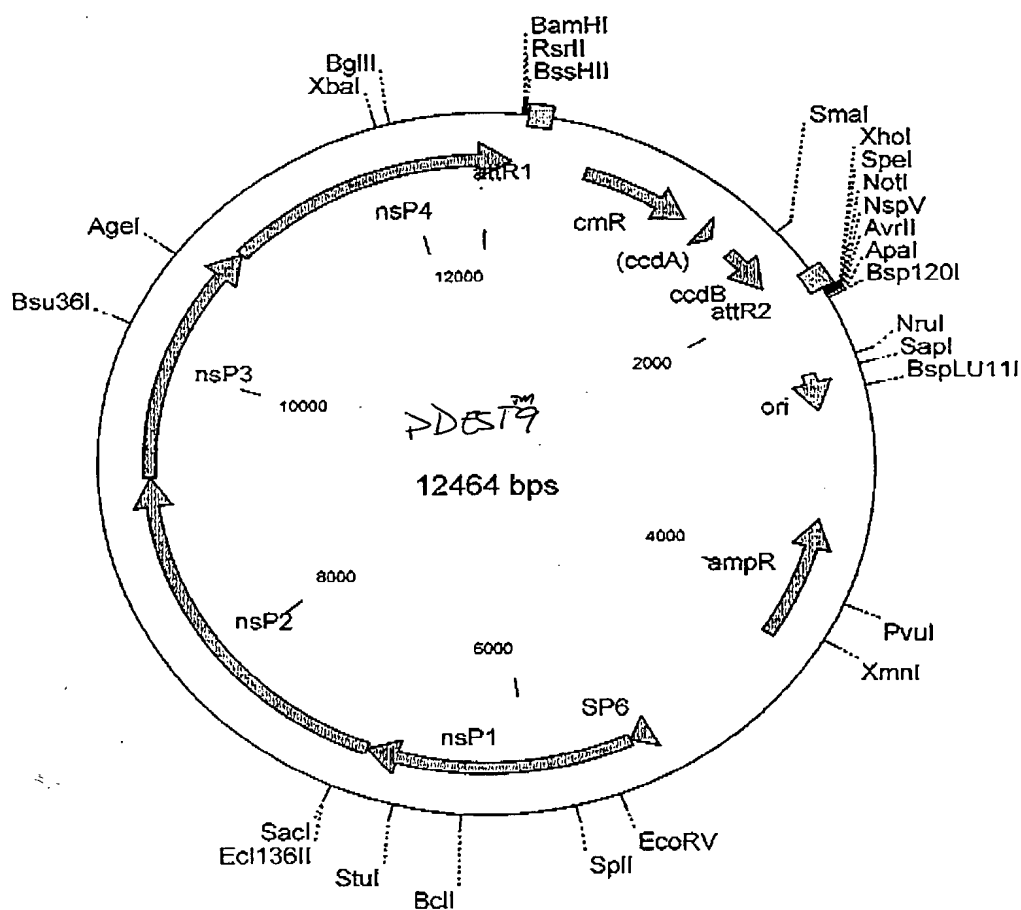
Semliki Forest Virus vector

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103  ttg gcg agg gac att aag gcg ttt aag aaa ttg aga gga cct gtt ata gac
    aac cgc tcc ctg taa ttc cgc aaa ttc ttt aac tct cct gga caa tat gtg
154  ctc tac ggc ggt cct aga ttg ggc cgt taa tac aca gaa ttc tga ttg gat
    gag atg ccg cca gga tct aac cac gca att atg tgt ctt aag act aac cta
205  ccc ggt ccg aag cgc gct ttc cca tca aca agt ttg/tac aac/aaa gct/gaa
    ggg cca ggc ttc gcg cga aag ggt agt tgt tca aac atg ttt ttc cga att
  
```

Handwritten annotations above the sequence:

- 243 promoter (above line 154)
- 245 RNA (above line 154)
- Bam (above line 154)
- Rsr II (above line 205)
- Tet (above line 205)
- att R1 (above line 205)



pDEST9 12464 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
355..232	attR1
605..1264	CmR
1384..1468	inactivated ccdA
1606..1911	ccdB
1952..2078	attR2
2532..2782	ori
3482..4282	ampR
5232..5365	SP6 promoter
5365..6965	nsP1:non-structural protein 1
6965..9265	nsP2:non-structural protein 2
9265..10865	nsP3:non-structural protein 3
10865..161	nsP4:non-structural protein 4

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1 AGCAAGTGGT TCCGGACAGG CTTGGGGGCC GAACTGGAGG TGGCACTAAC ATCTAGGTAT
61 GAGGTAGAGG GCTGCAAAAG TATCCTCATA GCCATGGCCA CCTTGGCGAG GGACATTAAG
121 GCGTTTAAAG AATTGAGAGG ACCTGTTATA CACCTCTACG GCGGTCCTAG ATTGGTGCCT
181 TAAATACACAG AATTCTGATT GGATCCCGGT CCGAAGCGCG CTTTCCCATC ACAAGTTTGT
241 ACAAAAAAGC TGAACGAGAA ACGTAAAAATG ATATAAATAT CAATATATTA AATTAGATTT
301 TGCATAAAAA ACAGACTACA TAATACTGTA AAACACAACA TATCCAGTCA CTATGGCGGC
361 CGCTAAGTTG GCAGCATCAC CCGACGCACT TTGCGCCGAA TAAATACCTG TGACGGAAGA
421 TCACTTCGCA GAATAAATAA ATCCTGGTGT CCCTGTTGAT ACCGGAAGC CCTGGGCCAA
481 CTTTTGGCGA AAATGAGACG TTGATCGGCA CGTAAGAGGT TCCAACTTTC ACCATAATGA
541 AATAAGATCA CTACCGGGCG TATTTTTTGA GTTATCGAGA TTTTCAGGAG CTAAGGAAGC
601 TAAAATGGAG AAAAAAATCA CTGGATATAC CACCGTTGAT ATATCCCAAT GGCATCGTAA
661 AGAACATTTT GAGGCATTTT AGTCAGTTGC TCAATGTACC TATAACCAGA CCGTTCAGCT
721 GGATATTACG GCCTTTTTTAA AGACCGTAAA GAAAAATAAG CACAAGTTTT ATCCGGCCTT
781 TATTCACATT CTTGCCCCGCC TGATGAATGC TCATCCGGAA TTCCGTATGG CAATGAAAGA
841 CGGTGAGCTG GTGATATGGG ATAGTGTTCA CCCTTGTTAC ACCGTTTTTC ATGAGCAAAC
901 TGAAACGTTT TCATCGCTCT GGAGTGAATA CCACGACGAT TTCCGGCAGT TTCTACACAT
961 ATATTCGCAA GATGTGGCGT GTTACGGTGA AAACCTGGCC TATTTCCCTA AAGGGTTTAT
1021 TGAGAATATG TTTTTCGTCT CAGCCAATCC CTGGGTGAGT TTCACAGTT TTGATTTAAA
1081 CGTGGCCAAT ATGGACAAC TCTTCGCCCC CGTTTTTACC ATGGGCAAAT ATTATACGCA
1141 AGGCGACAAG GTGCTGATGC CGCTGGCGAT TCAGGTTTAT CATGCCGTCT GTGATGGCTT
1201 CCATGTCGGC AGAATGCTTA ATGAATTACA ACAGTACTGC GATGAGTGGC AGGGCGGGGC
1261 GTAAAGATCT GGATCCGGCT TACTAAAAGC CAGATAACAG TATGCGTATT TGCGCGCTGA
1321 TTTTTCGGGT ATAAGAATAT ATACTGATAT GTATACCCGA AGTATGTCAA AAAGAGGTGT
1381 GCTATGAAGC AGCGTATTAC AGTGACAGTT GACAGCGACA GCTATCAGTT GCTCAAGGCA
1441 TATATGATGT CAATATCTCC GGTCTGGTAA GCACAACCAT GCAGAATGAA GCGCGTCGTC
1501 TCGGTGCCGA ACGCTGGAAA GCGGAAAATC AGGAAGGGAT GGCTGAGGTC GCGCGTTTAA
1561 TTGAAATGAA CGGCTCTTTT GCTGACGAGA ACAGGGACTG GTGAAATGCA GTTTAAGGTT
1621 TACACCTATA AAAGAGAGAG CCGTTATCGT CTGTTTGTGG ATGTACAGAG TGATATTATT
1681 GACACGCCCC GCGGACGGAT GGTGATCCCC CTGGCCAGTG CACGTCTGCT GTCAGATAAA
1741 GTCTCCCGTG AACTTTACCC GGTGGTGCAT ATCGGGGATG AAAGCTGGCG CATGATGACC
1801 ACCGATATGG CCAGTGTGCC GGTCTCCGTT ATCGGGGAAG AAGTGGCTGA TCTCAGCCAC
1861 CGCGAAAATG ACATCAAAAA CGCCATTAAC CTGATGTTCT GGGGAATATA AATGTCAGGC
1921 TCCCTTATAC ACAGCCAGTC TGCAGGTCGA CCATAGTGAC TGGATATGTT GTGTTTTACA
1981 GTATTATGTA GTCTGTTTTT TATGCAAAAG TGCTAATTTA ATATATTGAT ATTTATATCA
2041 TTTTACGTTT CTCGTTCAGC TTTCTTGTAAC AAAGTGGTGA TGGGAACCTG AGTTCAC TAG
2101 TCGATCCCGC GGCCGCTTTC GAACCTAGGC AAGCATGCGG GCGCAGTGGG TAATTAATTG
2161 AATTACATCC CTACGCAAAC GTTTTACGGC CGCCGGTGGC GCGCGCGCCC GGCGGCCCGT
2221 CTTTGGCCGT TGCAGGCCAC TCCGGTGGCT CCCGTCGTCC CCGACTTCCA GGCCAGCAG
2281 ATGCAGCAAC TCATCAGCGC CGTAAATGCG CTGACAATGA GACAGAACGC AATTGCTCCT
2341 GCTAGGAGCT TAATTCGACG AATAATTGGA TTTTATTATT ATTTTGCAAT TGGTTTTTAA
2401 TATTTCCAAA AAAAAAAAAA AAAAAAAAAA AAAAAAAAAA AAAAAAAAAA AAAAAAAAAA

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FIGURE 29B

2461 AAAAAAAAAA AAAAAAACTA GAAATCGCGA TTTCTAGTCT GCATTAATGA ATCGGCCAAC
2521 GCGCGGGGAG AGGCGGTTTG CGTATTGGGC GCTCTTCCGC TTCCTCGCTC ACTGACTCGC
2581 TGCGCTCGGT CGTTCGGCTG CGGCGAGCGG TATCAGCTCA CTCAAAGGCG GTAATACGGT
2641 TATCCACAGA ATCAGGGGAT AACGCAGGAA AGAACATGTG AGCAAAAGGC CAGCAAAAGG
2701 CCAGGAACCG TAAAAAGGCC GCGTTGCTGG CGTTTTTCCA TAGGCTCCGC CCCCTGACG
2761 AGCATCACAA AAATCGACGC TCAAGTCAGA GGTGGCGAAA CCCGACAGGA CTATAAAGAT
2821 ACCAGGCGTT TCCCCCTGGA AGCTCCCTCG TGCGCTCTCC TGTTCCGACC CTGCCGCTTA
2881 CCGGATACCT GTCCGCCTTT CTCCCTTCGG GAAGCGTGGC GCTTTCTCAA TGCTCGCGCT
2941 GTAGGTATCT CAGTTCGGTG TAGGTCGTTT GCTCCAAGCT GGGCTGTGTG CACGAACCCC
3001 CCGTTCAGCC CGACCGCTGC GCCTTATCCG GTAACATATCG TCTTGAGTCC AACCCGGTAA
3061 GATCCAGACTT ATCGCCACTG GCAGCAGCCA CTGGTAACAG GATTAGCAGA GCGAGGTATG
3121 TAGGCGGTGC TACAGAGTTC TTGAAGTGGT GGCCTAACTA CGGCTACACT AGAAGGACAG
3181 TATTTGGTAT CTGCGCTCTG CTGAAGCCAG TTACCTTCGG AAAAAGAGTT GGTAGCTCTT
3241 GATCCGGCAA ACAAAACCACC GCTGGTAGCG GTGGTTTTTT TGTTTGCAAG CAGCAGATTA
3301 CGCGCAGAAA AAAAGGATCT CAAGAAGATC CTTTGATCTT TTCTACGGGG TCTGACGCTC
3361 AGTGAACGA AAATCAGCT TAAGGGATTT TGGTCATGAG ATTATCAAAA AGGATCTTCA
3421 CCTAGATCCT TTAAATTAAT AAATGAAGTT TTAAATCAAT CTAAAGTATA TATGAGTAAA
3481 CTTGGTCTGA CAGTTACCAA TGCTTAATCA GTGAGGCACC TATCTCAGCG ATCTGTCTAT
3541 TTCGTTTCAT CATAGTTGCC TGAATCCCG TCGTGTAGAT AACTACGATA CGGGAGGGCT
3601 TACCATCTGG CCCAGTGCT GCAATGATAC CGCGAGACCC ACGCTCACC GCTCCAGATT
3661 TATCAGCAAT AAACCAGCCA GCCGGAAGGG CCGAGCGCAG AAGTGGTCTT GCAACTTTAT
3721 CCGCTCCCAT CCAGTCTATT AATTGTTGCC GGAAGCTAG AGTAAGTAGT TCGCCAGTTA
3781 ATAGTTTGCG CAACGTTGTT GCCATTGCTA CAGGCATCGT GGTGTACGCG TCGTCTGTTG
3841 GTATGGCTTC ATTCAGCTCC GGTTCCCAAC GATCAAGGCG AGTTACATGA TCCCCATGT
3901 TGTGCAAAAA AGCGGTTAGC TCCTTCGGTC CTCCGATCGT TGTCAGAAGT AAGTTGGCCG
3961 CAGTGTATAT ACTCATGGTT ATGGCAGCAC TGCATAATTC TCTTACTGTC ATGCCATCCG
4021 TAAGATGCTT TTCTGTGACT GGTGAGTACT CAACCAAGTC ATCTGTAGAA TAGTGTATGC
4081 GCGGACCGAG TTGCTCTTGC CCGGCGTCAA TACGGGATAA TACCGCGCCA CATAGCAGAA
4141 CTTTAAAGT GCTCATCATT GGAAACGTT CTTGCGGGCG AAAACTCTCA AGGATCTTAC
4201 CGCTGTTGAG ATCCAGTTCG ATGTAACCCA CTCGTGCACC CAACTGATCT TCAGCATCTT
4261 TTACTTTTAC CAGCGTTTCT GGGTGAGCAA AAACAGGAAG GCAAAATGCC GCAAAAAGG
4321 GAATAAGGGC GACACGGAAA TGTTGAATAC TCATACTCTT CTTTTTCAA TATTATTGAA
4381 GCATTTATCA GGGTTATTGT CTCATGAGCG GATACATATT TGAATGTATT TAGAAAAATA
4441 AACAAATAGG GGTTCCGCGC ACATTTCCCC GAAAAGTGCC ACCTGACGTC TAAGAAACCA
4501 TTATTATCAT GACATTAACC TATAAAAAATA GGCGTATCAC GAGGCCCTTT CGTCTCGCGC
4561 GTTTCGGTGA TGACGGTGAA AACCTCTGAC ACATGCAGCT CCCGGAGACG GTCACAGCTT
4621 CTGTCTAAGC GGATGCCGGG AGCAGACAAG CCCGTCAGGG CGCGTCAGCG GTGTTGGCG
4681 GGTGTGCGGG CTGGCTTAAC TATGCGGCAT CAGAGCAGAT TGTACTGAGA GTGCACCATA
4741 TCGACGCTCT CCCTTATGCG ACTCCTGCAT TAGGAAGCAG CCCAGTACTA GGTGAGGCC
4801 GTTGAGCACC GCCGCCGCAA GGAATGGTGC ATGCAAGGAG ATGGCGCCCA ACAGTCCCCC
4861 GGCCACGGGG CCTGCCACCA TACCCACGCC GAAACAAGCG CTCATGAGCC CGAAGTGGCG
4921 AGCCCGATCT TCCCCATCGG TGATGTCGGC GATATAGGCG CCAGCAACCG CACCTGTGGC
4981 GCCGGTGATG CCGGCCACGA TGCGTCCGGC GTAGAGGATC TGGCTAGCGA TGACCCTGCT
5041 GATTGGTTTC CTGACCATT TCCGGGTGCG GAACGGCGTT ACCAGAACT CAGAAGGTT
5101 GTCCAACCAA ACCGACTCTG ACGGCAGTTT ACGAGAGAGA TGATAGGGTC TGCTTCAGTA
5161 AGCCAGATGC TACACAATTA GGCTTGTTACA TATTGTCGTT AGAACGCGGC TACAATTAAT
5221 ACATAACCTT ATGTATCATA CACATACGAT TTAGGTGACA CTATAGATGG CGGATGTGTG
5281 ACATACACGA CGCCAAAAGA TTTTGTTCCT GCTCCTGCCA CCTCCGCTAC GCGAGAGATT
5341 AACCACCCAC GATGGCCGCC AAAGTGCATG TTGATATTGA GGCTGACAGC CCATTCATCA
5401 AGTCTTTGCA GAAGGCATTT CCGTCGTTTC AGGTGGAGTC ATTGCAGGTC ACACCAAATG
5461 ACCATGCAAA TGCCAGAGCA TTTTCGCACC TGGCTACCAA ATTGATCGAG CAGGAGACTG
5521 ACAAAGACAC ACTCATCTTG GATATCGGCA GTGCGCCTTC CAGGAAATG ATGTCTACGC
5581 ACAAATACCA CTGCGTATGC CCTATGCGCA GCGCAGAAGA CCCCAGAAAG CTCGATAGCT
5641 ACGCAAGAAA ACTGGCAGCG GCCTCCGGGA AGGTGCTGGA TAGAGAGATC GCAGGAAAAA
5701 TCACCGACCT GCAGACCGTC ATGGCTACGC CAGACGCTGA ATCTCCTACC TTTTGCCTGC
5761 ATACAGACGT CACGTGTCGT ACGGCAGCCG AAGTGGCCGT ATACCAGGAC GTGTATGCTG
5821 TACATGCACC AACATCGCTG TACCATCAGG CGATGAAAGG TGTCAGAACG GCGTATTGGA
5881 TTGGGTTTGA CACCACCCCG TTTATGTTTG ACGCGCTAGC AGGCGCGTAT CCAACCTACG-

FIGURE 29C

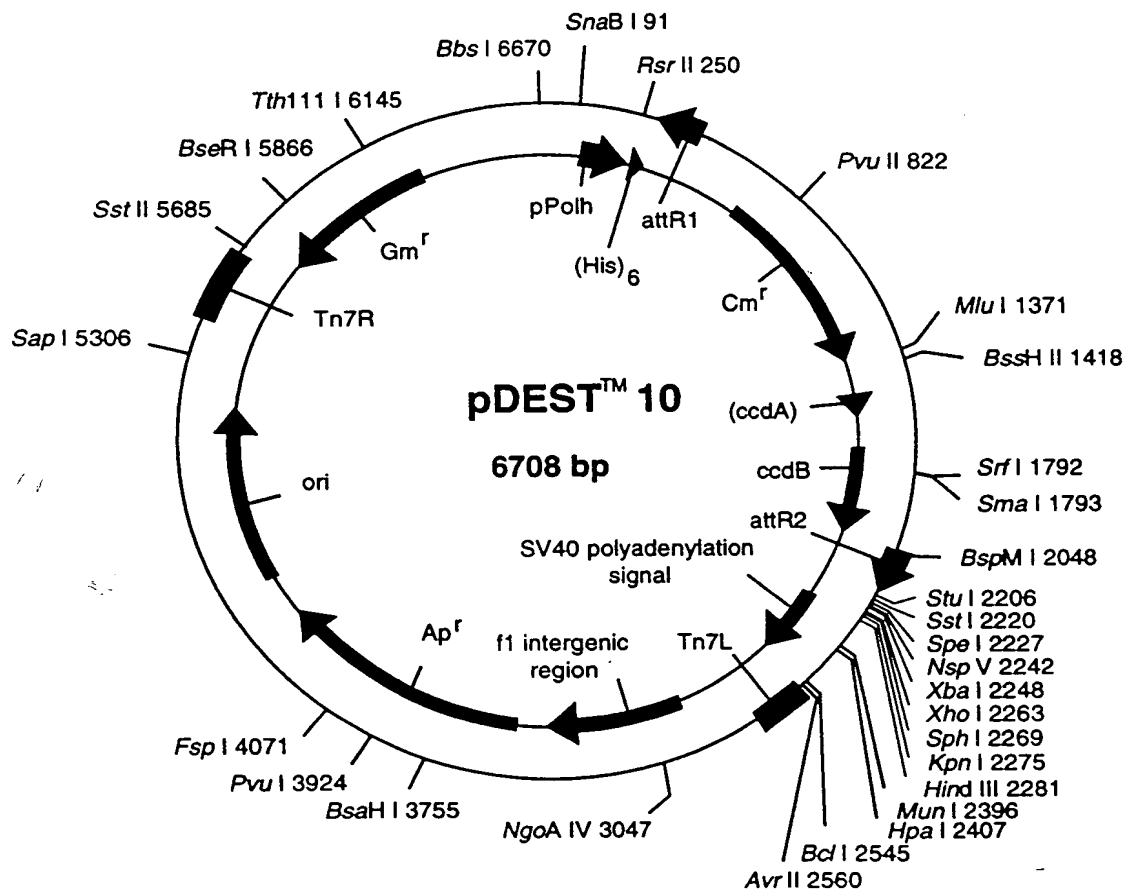
Figure 30A: pDEST10 Polyhedron Promoter with N-His6, Baculovirus Transfer Plasmid

154 *← mRut from polyhedrin promoter*
aaa taa gta ttt tac tgt ttt cgt aac agt ttt gta ata aaa aaa cct ata
ttt att cat aaa atg aca aaa gca ttg tca aaa cat tat ttt ttt gga tat

205
aat att ccg gat tat tca tac cgt ccc acc atc ggg cgc gga tct cgg tcc
tta taa ggc cta ata agt atg gca ggg tgg tag ccc gcg cct aga gcc agg

256 Met Ser Tyr Tyr His His His His His His Asp Tyr Asp Ile Pro
gaa acc atg tgc tac tac cat cac cat cac cat cac gat tac gat atc cca
ctt tgg tac agc atg atg gta gtg gta gtg gta gtg cta atg cta tag ggt

307 TEV protease
Thr Thr Glu Asn Leu Tyr Phe Gln Gly Ile ~~Thr Ser Leu Tyr Lys Lys~~
acg acc gaa aac ctg tat ttt cag ggc atc ~~aca agt ttg tac ada aaa ggc~~
tgc tgg ctt ttg gac ata aaa gtc ccg tag ~~tgt tca aac atg ttt ttc oga~~
attR1 Int



pDEST10 6708 bp

Location (Base Nos.)	Gene Encoded
23..152	Ppolh
461..337	attR1
711..1370	CmR
1490..1574	inactivated ccdA
1712..2017	ccdB
2058..2182	attR2
3394..4369	ampR
4510..5164	ori
5658..62	genR

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1  CCCC GGATGA AGTGGTTCGC ATCCTCGGTT TTCTGGAAGG CGAGCATCGT TTGTTCGCCC
61 AGGACTCTAG CTATAGTTCT AGTGGTTGGC TACGTATACT CCGGAATATT AATAGATCAT
121 GGAGATAATT AAAATGATAA CCATCTCGCA AATAAATAAG TATTTTACTG TTTTCGTAAC
181 AGTTTTGTAA TAAAAAAACC TATAAATATT CCGGATTATT CATACCGTCC CACCATCGGG
241 CGCGGATCTC GGTCCGAAAC CATGTCGTAC TACCATCACC ATCACCATCA CGATTACGAT
301 ATCCCAACGA CCGAAAACCT GTATTTTTCAG GGCATCACAA GTTTGTACAA AAAAGCTGAA
361 CGAGAAACGT AAAATGATAT AAATATCAAT ATATTAAATT AGATTTTGCA TAAAAACAG
421 ACTACATAAT ACTGTAAAAC ACAACATATC CAGTCACTAT GGCGGCCGCT AAGTTGGCAG
481 CATCACCCGA CGCACTTTGC GCCGAATAAA TACCTGTGAC GGAAGATCAC TTCGCAGAAT
541 AAATAAATCC TGGTGTCCCT GTTGATACCG GGAAGCCCTG GGCCAACCTT TGGCGAAAAT
601 GAGACGTTGA TCGGCACGTA AGAGGTTCCA ACTTTCACCA TAATGAAATA AGATCACTAC
661 CGGGCGTATT TTTTGAGTTA TCGAGATTTT CAGGAGCTAA GGAAGCTAAA ATGGAGAAAA
721 AAATCACTGG ATATACCACC GTTGATATAT CCCAATGGCA TCGTAAAGAA CATTTTGAGG
781 CATTTTCAGT AGTTGCTCAA TGTACCTATA ACCAGACCGT TCAGCTGGAT ATTACGGCCT
841 TTTTAAAGAC CGTAAAGAAA AATAAGCACA AGTTTTATCC GGCCTTTATT CACATTCTTG
901 CCCGCCTGAT GAATGCTCAT CCGGAATTCC GTATGGCAAT GAAAGACGGT GAGCTGGTGA
961 TATGGGATAG TGTTACCCCT TGTTACACCG TTTTCCATGA GCAAACGTAA ACGTTTTCAT
1021 CGCTCTGGAG TGAATACCAC GACGATTTCC GGCAGTTTCT ACACATATAT TCGCAAGATG
1081 TGGCGTGTGA CCGTGAAAAC CTGGCCTATT TCCCTAAAGG GTTTATTGAG AATATGTTTT
1141 TCGTCTCAGC CAATCCCTGG GTGAGTTTCA CCAGTTTTGA TTTAAACGTG GCCAATATGG
1201 ACAACTTCTT CGCCCCCGTT TTCACCATGG GCAAATATTA TACGCAAGGC GACAAGGTGC
1261 TGATGCCGCT GGCGATTGAG GTTCATCATG CCGTCTGTGA TGGCTTCCAT GTCGGCAGAA
1321 TGCTTAATGA ATTACAACAG TACTGCGATG AGTGGCAGGG CGGGGCGTAA ACGCGTGGAT
1381 CCGGCTTACT AAAAGCCAGA TAACAGTATG CGTATTTGCG CGCTGATTTT TGCGGTATAA
1441 GAATATATAC TGATATGTAT ACCCGAAGTA TGTCAAAAAG AGGTGTGCTA TGAAGCAGCG
1501 TATTACAGTG ACAGTTGACA GCGACAGCTA TCAGTTGCTC AAGGCATATA TGATGTCAAT
1561 ATCTCCGGTC TGGTAAGCAC AACCATGCA AATGAAGCCC GTCGTCTGCG TGCCGAACGC
1621 TGGAAAGCGG AAAATCAGGA AGGGATGGCT GAGGTCGCCC GGTTTATTGA AATGAACGGC
1681 TCTTTTGCTG ACGAGAACAG GGACTGGTGA AATGCAGTTT AAGGTTTACA CCTATAAAG
1741 AGAGAGCCGT TATCGTCTGT TTGTGGATGT ACAGAGTGAT ATTATTGACA CGCCCGGGCG
1801 ACGGATGGTG ATCCCCCTGG CCAGTGCACG TCTGCTGTCA GATAAAGTCT CCCGTGAACT
1861 TTACCCGGTG GTGCATATCG GGGATGAAAG CTGGCGCATG ATGACCACCG ATATGGCCAG
1921 TGTGCCGGTC TCCGTTATCG GGAAGAAGT GGCTGATCTC AGCCACCGCG AAAATGACAT
1981 CAAAACGCC ATTAACCTGA TGTCTGGGG AATATAAATG TCAGGCTCCC TTATACACAG
2041 CCAGTCTGCA GGTCGACCAT AGTGAAGTGA TATGTTGTGT TTTACAGTAT TATGTAGTCT
2101 GTTTTTTATG CAAAATCTAA TTAAATATAT TGATATTTAT ATCATTTTAC GTTCTCGTT
2161 CAGCTTTCTT GTACAAAGTG GTGATGCCAT GGATCCGGAA TTCAAAGGCC TACGTCGACG
2221 AGCTCAACTA GTGCGGCCGC TTTCAATCT AGAGCCTGCA GTCTCGAGGC ATGCGGTACC
2281 AAGCTTGTCG AGAAGTACTA GAGGATCATA ATCAGCCATA CCACATTTGT AGAGGTTTTA
2341 CTTGCTTTAA AAAACCTCCC ACACCTCCCC CTGAACCTGA AACATAAAAT GAATGCAATT
2401 GTTGTTGTAA ACTTGTTTAT TGCAGCTTAT AATGGTTACA AATAAAGCAA TAGCATCACA
2461 AATTTACAAA ATAAAGCATT TTTTCACTG CATTCTAGTT GTGGTTTGTC CAAACTCATC
2521 AATGTATCTT ATCATGTCTG GATCTGATCA CTGCTTGAGC CTAGGAGATC CGAACCAGAT
2581 AAGTGAAATC TAGTTCCAAA CTATTTTGTC ATTTTAAATT TTCGTATTAG CTTACGACGC-

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FIGURE 30B

2641	TACACCCAGT	TCCCATCTAT	TTTGTCACTC	TTCCCTAAAT	AATCCTTAAA	AACTCCATT
2701	CCACCCCTCC	CAGTTCCCAA	CTATTTTGTG	CGCCACAGC	GGGGCATTTT	TCTTCCTGTT
2761	ATGTTTTTAA	TCAAACATCC	TGCCAACTCC	ATGTGACAAA	CCGTCATCTT	CGGCTACTTT
2821	TTCTCTGTCA	CAGAATGAAA	ATTTTTCTGT	CATCTCTTCG	TTATTAATGT	TTGTAATTGA
2881	CTGAATATCA	ACGCTTATTT	GCAGCCTGAA	TGGCGAATGG	GACGCGCCCT	GTAGCGGCGC
2941	ATTAAGCGCG	GCGGGTGTGG	TGGTTACGCG	CAGCGTGACC	GCTACACTTG	CCAGCGCCCT
3001	AGCGCCCGCT	CCTTTTCGCTT	TCTTCCCTTC	CTTTCTCGCC	ACGTTTCGCCG	GCTTTCCCCG
3061	TCAAGCTCTA	AATCGGGGGC	TCCCTTTAGG	GTTCCGATTT	AGTGCTTTAC	GGCACCTCGA
3121	CCCCAAAAAA	CTTGATTAGG	GTGATGGTTC	ACGTAGTGGG	CCATCGCCCT	GATAGACGGT
3181	TTTTTCGCCCT	TTGACGTTGG	AGTCCACGTT	CTTTAATAGT	GGACTCTTGT	TCCAAACTGG
3241	AACAACACTC	AACCCTATCT	CGGTCTATTC	TTTTGATTTA	TAAGGGATTT	TGCCGATTTT
3301	GGCCTATTGG	TTAAAAAATG	AGCTGATTTA	ACAAAAATTT	AACGCGAATT	TTAACAAAAAT
3361	ATTAACGTTT	ACAATTTACG	TGGGCACTTT	TCGGGGAAAT	GTGCGCGGAA	CCCCTATTTG
3421	TTTATTTTTT	TAAATACATT	CAAATATGTA	TCCGCTCATG	AGACAATAAC	CCTGATAAAT
3481	GCTTCAATAA	TATTGAAAAA	GGAAGAGTAT	GAGTATTCAA	CATTTCCGTG	TCGCCCTTAT
3541	TCCCTTTTTT	GCGGCATTTT	GCCTTCCTGT	TTTTTGCTCAC	CCAGAAACGC	TGGTGAAAGT
3601	AAAAGATGCT	GAAGATCAGT	TGGGTGCACG	AGTGGGTTAC	ATCGAACTGG	ATCTCAACAG
3661	CGGTAAGATC	CTTGAGAGTT	TTCGCCCCGA	AGAACGTTTT	CCAATGATGA	GCACTTTTAA
3721	AGTTCTGCTA	TGTGGCGCGG	TATTATCCCG	TATTGACGCC	GGGCAAGAGC	AACTCGGTCC
3781	CCGCATACAC	TATTCTCAGA	ATGACTTGGT	TGAGTACTCA	CCAGTCACAG	AAAAGCATCT
3841	TACGGATGGC	ATGACAGTAA	GAGAATTATG	CAGTGCTGCC	ATAACCATGA	GTGATAACAC
3901	TGCGGCCAAC	TTACTTCTGA	CAACGATCGG	AGGACCGAAG	GAGCTAACCG	CTTTTTTGCA
3961	CAACATGGGG	GATCATGTAA	CTCGCCTTGA	TCTGTGGGAA	CCGGAGCTGA	ATGAAGCCAT
4021	ACCAAACGAC	GAGCGTGACA	CCACGATGCC	TGTAGCAATG	GCAACAACGT	TGCGCAAAC
4081	ATTAACCTGG	GAACTACTTA	CTCTAGCTTC	CCGGCAACAA	TTAATAGACT	GGATGGAGGC
4141	GGATAAAGTT	GCAGGACCAC	TTCTGCGCTC	GGCCCTTCCG	GCTGGCTGGT	TTATTGCTGA
4201	TAAATCTGGA	GCCGGTGAAG	GTGGGTCTCG	CGGTATCATT	GCAGCACTGG	GGCCAGATGG
4261	TAAGCCCTCC	CGTATCGTAG	TTATCTACAC	GACGGGGAGT	CAGGCAACTA	TGGATGAACG
4321	AAATAGACAG	ATCGCTGAGA	TAGGTGCCTC	ACTGATTAAG	CATTGGTAAC	TGTCAGACCA
4381	AGTTTACTCA	TATATACTTT	AGATTGATTT	AAAACCTTCAT	TTTTAATTTA	AAAGGATCTA
4441	GGTGAAGATC	CTTTTTTGATA	ATCTCATGAC	CAAAATCCCT	TAACGTGAGT	TTTCGTTC
4501	CTGAGCGTCA	GACCCCGTAG	AAAAGATCAA	AGGATCTTCT	TGAGATCCCT	TTTTTCTGCG
4561	CGTAATCTGC	TGCTTGCAAA	CAAAAAAAC	ACCGCTACCA	GCGGTGGTTT	GTTTGCCGGA
4621	TCAAGAGCTA	CCAACCTCTT	TTCCGAAGGT	AACTGGCTTC	AGCAGAGCGC	AGATAACAAA
4681	TACTGTCTTT	CTAGTGTAGC	CGTAGTTAGG	CCACCACTTC	AAGAACTCTG	TAGCACCGCC
4741	TACATACCTC	GCTCTGCTAA	TCCTGTTACC	AGTGGCTGCT	GCCAGTGGCG	ATAAGTCGTG
4801	TCTTACCGGG	TTGGACTCAA	GACGATAGTT	ACCGGATAAG	GCGCAGCGGT	CGGGCTGAAC
4861	GGGGGGTTTC	TGCACACAGC	CCAGCTTGGA	GCGAACGACC	TACACCGAAC	TGAGATACCT
4921	ACAGCGTGAG	CATTGAGAAA	GCGCCACGCT	TCCCGAAGGG	AGAAAGGCGG	ACAGGTATCC
4981	GGTAAGCGGC	AGGGTCGGAA	CAGGAGAGCG	CACGAGGGAG	CTTCCAGGGG	GAAACGCCTG
5041	GATCTTTTAT	AGTCCTGTCT	GGTTTCGCCA	CCTCTGACTT	GAGCGTCGAT	TTTTGTGATG
5101	CTCGTCAGGG	GGGCGGAGCC	TATGGAAAAA	CGCCAGCAAC	GCGGCCTTTT	TACGGTTTCT
5161	GGCCTTTTGC	TGGCCTTTTG	CTCACATGTT	CTTTCTGCG	TTATCCCTTG	ATTCTGTGGA
5221	TAACCGTATT	ACCGCCTTTG	AGTGAGCTGA	TACCCCTCGC	CGCAGCCGAA	GCACCGAGCG
5281	CAGCGAGTCA	GTGAGCGAGG	AAGCGGAAGA	GCGCCTGATG	CGGTATTTTC	TCCTTACGCA
5341	TCTGTGCGGT	ATTTACACCC	GCAGACCAGC	GCGGTAACCT	GGCAAAATCG	GTTACGGTTG
5401	AGTAATAAAT	GGATGCCCTG	CGTAAGCGGG	TGTGGGCGGA	CAATAAAGTC	TTAAACTGAA
5461	CAAAATAGAT	CTAAACTATG	ACAATAAAGT	CTTAAACTAG	ACAGAATAGT	TGTAAACTGA
5521	AATCAGTCCA	GTTATGCTGT	GAAAAAGCAT	ACTGGACTTT	TGTTATGGCT	AAAGCAAAC
5581	CTTCATTTTC	TGAAGTGCAA	ATTGCCCGTC	GTATTAAAGA	GGGGCGTGGC	CAAGGGCATG
5641	GTAAAGACTA	TATTTCGCGC	GTTGTGACAA	TTTACCGAAC	AACTCCGCGG	CCGGGAAGCC
5701	GATCTCGGCT	TGAACGAATT	GTTAGGTGGC	GGTACTTGGG	TCGATATCAA	AGTGATCATC
5761	TTCTTCCCGT	ATGCCCAACT	TTGTATAGAG	AGCCACTGCG	GGATCGTCAC	CGTAATCTGC
5821	TTGCACGTAG	ATCACATAAG	CACCAAGCGC	GTTGGCTCTA	TGCTTGAGGA	GATTGATGAG
5881	CGCGCTGGCA	ATGCCCTGCC	TCCGGTGCTC	GCCGGAGACT	GCGAGATCAT	AGATATAGAT
5941	CTCACTACGC	GGCTGCTCAA	ACCTGGGCAG			

FIGURE 30C

Figure 31A:

pDEST11

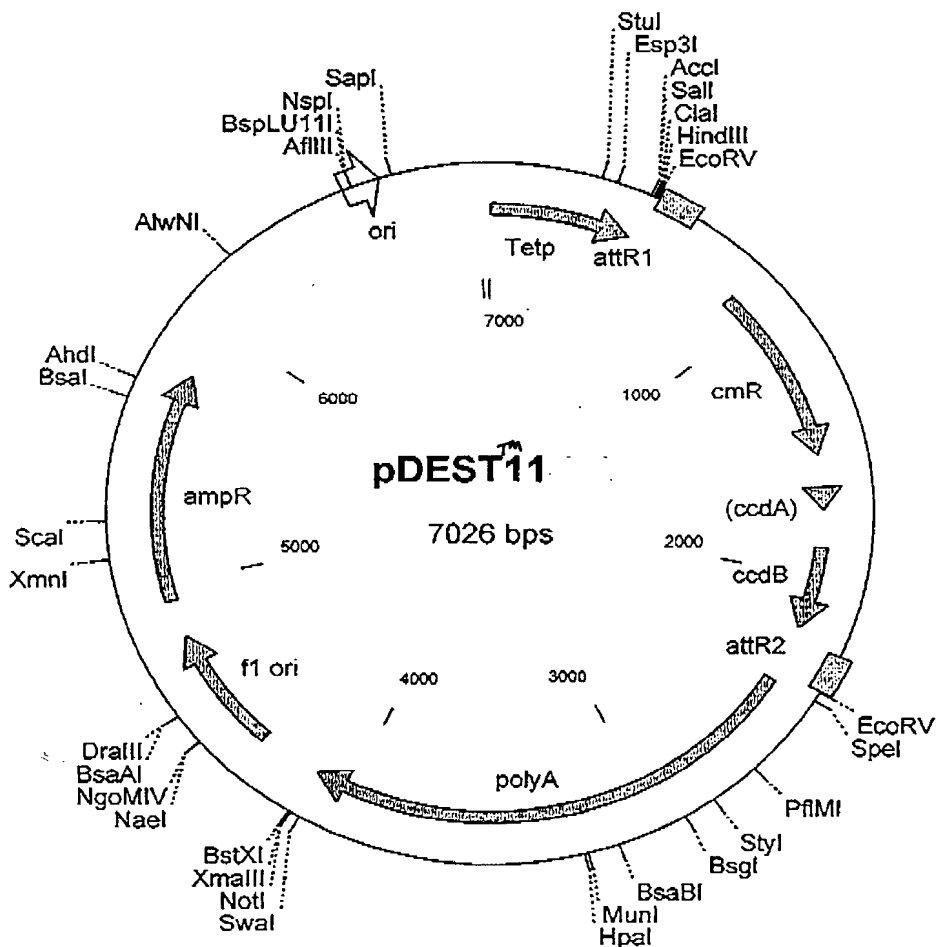
Tet-regulated eukaryotic expression

358 tag tga acc gfc ^{mRNA from CMV promoter (controlled by tetracycline)} aga tgc cct gga gac gcc atc cac gct gtt ttg acc tcc
 atc act tgg cag tct agc gga cct ctg cgg tag gtg cga caa aac tgg agg

409 ata gaa gac acc ggg acc gat cca gcc tcc gcg gcc cgg aat tgc agc tgc
 tat ctt ctg tgg ccc tgg cta ggt cgg agg cgc cgg ggc tta agc tgc agc

460 gta ccc ggg gat cct cta gag tgc agg ^{SalI} tgc acg gta ^{ClaI} tgc ^{Hind3} ata ^{EcoRV} agc ttg aca
 cat ggg ccc cta gga gat ctc agc tcc agc tgc cat agc tat tgc aac tat

511 tca ~~aca agt ttg~~ ^{Int} ~~gag aag aag ggc gaa cga gaa acg taa~~ ^{attR1} ~~gat gat ata gat~~
 agt ~~tgt tca aac atg ttt~~ ~~tgt cga ctt gct ctc tgc att tta cta tat tta~~



pDEST11 7026 bp

Location (Base Nos.)

4..479
638..514
888..1547
1667..1751
1889..2194
2235..2359
2402..4132
4347..4803
4940..5797

Gene Encoded

Tetp ((Tet operator)7 and min
hCMV promoter'
attR1
CmR
inactivated ccdA
ccdB
attR2
polyA
f1 ori
ampR

1 CGAGTTTACC ACTCCCTATC AGTGATAGAG AAAAGTGAAA GTCGAGTTTA CCACTCCCTA
61 TCAGTGATAG AGAAAAGTGA AAGTCGAGTT TACCACTCCC TATCAGTGAT AGAGAAAAGT
121 GAAAGTCGAG TTTACCACTC CCTATCAGTG ATAGAGAAAA GTGAAAGTCG AGTTTACCAC
181 TCCCTATCAG TGATAGAGAA AAGTGAAAGT CGAGTTTACC ACTCCCTATC AGTGATAGAG
241 AAAAGTGAAA GTCGAGTTTA CCACTCCCTA TCAGTGATAG AGAAAAGTGA AAGTCGAGCT
301 CGGTACCCGG GTCGAGTAGG CGTGTACGGT GGGAGGCCTA TATAAGCAGA GCTCGTTTAG
361 TGAACCGTCA GATCGCCTGG AGACGCCATC CACGCTGTTT TGACCTCCAT AGAAGACACC
421 GGGACCGATC CAGCCTCCGC GGCCCCGAAT TCGAGCTCGG TACCCGGGGA TCCTCTAGAG
481 TCGAGGTCGA CGGTATCGAT AAGCTTGATA TCAACAAGTT TGTACAAAA AGCTGAACGA
541 GAAACGTAAA ATGATATATA TATCAATATA TTAAATTAGA TTTTGCATAA AAAACAGACT
601 ACATAATACT GTAAAAACACA ACATATCCAG TCACTATGGC GGCCGCTAAG TTGGCAGCAT
661 CACCCGACGC ACTTTGCGCC GAATAAATAC CTGTGACGGA AGATCACTTC GCAGAATAAA
721 TAAATCCTGG TGTCCTGTG GATTCCAACT TTCACCATAA TGAAATAAGA TCACTACCGG
781 ACGTTGATCG GCACGTAAGA GGTTCCTGTT GAGCTAAGGA AGCTAAAATG GAGAAAAAAA
841 GCGTATTTTT TGAGTTATCG AGATTTTCAG GAGCTAAGGA AGCTAAAATG GAGAAAAAAA
901 TCACTGGATA TACCACCGTT GATATATCCC AATGGCATCG TAAAGAACAT TTTGAGGCAT
961 TTCAGTCAGT TGCTCAATGT ACCTATAACC AGACCGTTCA GCTGGATATT ACGGCCTTTT
1021 TAAAGACCGT AAAGAAAAAT AAGCACAAGT TTTATCCGGC CTTTATTCAC ATTCTTGCCC
1081 GCCTGATGAA TGCTCATCCG GAATTCCTGTA TGGCAATGAA AGACGGTGAG CTGGTGATAT
1141 GGGATAGTGT TCACCCTTGT TACACCCTTT TCCATGAGCA AACTGAAACG TTTTCATCGC
1201 TCTGGAGTGA ATACCACGAC GATTTCCGGC AGTTTCTACA CATATATTCT CAAGATGTGG
1261 CGTGTTACGG TGAAAACCTG GCCTATTTCC CTAAAGGGTT TATTGAGAAT ATGTTTTTCG
1321 TCTCAGCCAA TCCCTGGGTG AGTTTCACCA GTTTTGATT AAACGTGGCC AATATGGACA
1381 ACTTCTTCGC CCCCGTTTTT ACCATGGGCA AATATTATAC GCAAGGCGAC AAGGTGCTGA
1441 TGCCGCTGGC GATTCAGGTT CATCATGCCG TCTGTGATGG CTTCCATGTC GGCAGAATGC
1501 TTAATGAATT ACAACAGTAC TGCGATGAGT GGCAGGGCGG GGCCTAAAGA TCTGGATCCG
1561 GCTTACTAAA AGCCAGATAA CAGTATGCGT ATTTGCGCGC TGATTTTTGC GGTATAAGAA
1621 TATATACTGA TATGTATACC CGAAGTATGT CAAAAAGAGG TGTGCTATGA AGCAGCGTAT
1681 TACAGTGACA GTTGACAGCG ACAGCTATCA GTTGCTCAAG GCATATATGA TGTCAATATC
1741 TCCGGTCTGG TAAGCACAAC CATGCAGAAT GAAGCCCGTC GTCTGCGTGC CGAACGCTGG
1801 AAAGCGGAAA ATCAGGAAGG GATGGCTGAG GTCGCCCCGGT TTATTGAAAT GAACGGCTCT
1861 TTTGCTGACG AGAACAGGGA CTGGTGAAAT GCAGTTTAAG GTTTACACCT ATAAAAAGAGA
1921 GAGCCGTTAT CGTCTGTTTG TGGATGTACA GAGTGATATT ATTGACACGC CCGGGCGACG
1981 GATGGTGATC CCCCTGGCCA GTGCACGTCT GCTGTCAGAT AAAGTCTCCC GTGAACTTTA
2041 CCCGGTGGTG CATATCGGGG ATGAAAGCTG GCGCATGATG ACCACCGATA TGGCCAGTGT
2101 GCCGTCTCC GTTATCGGGG AAGAAGTGGC TGATCTCAGC CACCGCGAAA ATGACATCAA
2161 AAACGCCATT AACCTGATGT TCTGGGGAAT ATAAATGTCA GGCTCCCTTA TACACAGCCA
2221 GTCTGCAGGT CGACCATAGT GACTGGATAT GTTGTGTTTT ACAGTATTAT GTAGTCTGTT
2281 TTTTATGCAA AATCTAATTT AATATATTGA TATTTATATC ATTTTACGTT TCTCGTTTCA
2341 CTTTCTTGTA CAAAGTGGTT GATATCGAAT TCCTGCAGCC CGGGGGATCC ACTAGTTCTA
2401 GAGCACTGCG ATGAGTGGCA GGGCGGGGCG TAATTTTTTT AAGGCAGTTA TTGGTGCCCT
2461 TAAACGCCTG GTGCTACGCC TGAATAAGTG ATAATAAGCG GATGAATGGC AGAAATTCGC
2521 CGGATCTTTG TGAAGGAACC TTACTTCTGT GGTGTGACAT AATTGGACAA ACTACCTACA-

FIGURE 313

5941 CAACTCGGTC GCCGCATACA CTATTCTCAG AATGACTTGG TTGAGTACTC ACCAGTCACA
 6001 GAAAAGCATC TTACGGATGG CATGACAGTA AGAGAATTAT GCAGTGCTGC CATAACCATG
 6061 AGTGATAACA CTGCGGCCAA CTTACTTCTG ACAACGATCG GAGGACCGAA GGAGCTAACC
 6121 GCTTTTTTGC ACAACATGGG GGATCATGTA ACTCGCCTTG ATCGTTGGGA ACCGGAGCTG
 6181 AATGAAGCCA TACCAAACGA CGAGCGTGAC ACCACGATGC CTGTAGCAAT GGCAACAACG
 6241 TTGCGCAAAC TATTAAGTGG CGAACTACTT ACTCTAGCTT CCCGGCAACA ATTAATAGAC
 6301 TGGATGGAGG CGGATAAAGT TGCAGGACCA CTTCTGCGCT CGGCCCTTCC GGCTGGCTGG
 6361 TTTATTGCTG ATAAATCTGG AGCCGGTGAG CGTGGGTCTC GCGGTATCAT TGCAGCACTG
 6421 GGGCCAGATG GTAAGCCCTC CCGTATCGTA GTTATCTACA CGACGGGGAG TCAGGCAACT
 6481 ATGGATGAAC GAAATAGACA GATCGCTGAG ATAGGTGCCT CACTGATTAA GCATTGGTAA
 6541 CTGTCAGACC AAGTTTACTC ATATATACTT TAGATTGATT TAAAACTTCA TTTTAAATTT
 6601 AAAAGGATCT AGGTGAAGAT CCTTTTTGAT AATCTCATGA CCAAATCCC TTAACGTGAG
 6661 TTTTCGTTCC ACTGAGCGTC AGACCCCGTA GAAAAGATCA AAGGATCTTC TTGAGATCCT
 6721 TTTTTTCTGC GCGTAATCTG CTGCTTGCAA ACAAAAAAAC CACCGCTACC AGCGGTGGTT
 6781 TGTTTGCCGG ATCAAGAGCT ACCAACTCTT TTTCCGAAGG TAACTGGCTT CAGCAGAGCG
 6841 CAGATACCAA ATACTGTCCT TCTAGTGTAG CCGTAGTTAG GCCACCACTT CAAGAACTCT
 6901 GTAGCACCGC CTACATACCT CGCTCTGCTA ATCCTGTTAC CAGTGGCTGC TGCCAGTGGC
 6961 GATAAGTCGT GTCTTACCGG GTTGGACTCA AGACGATAGT TACCGGATAA GGCGCAGCGG
 7021 TCGGGCTGAA CGGGGGGTTT GTGCACACAG CCCAGCTTGG AGCGAACGAC CTACACCGAA
 7081 CTGAGATACC TACAGCGTGA GCATTGAGAA AGCGCCACGC TTCCCGAAGG GAGAAAGGCG
 7141 GACAGGTATC CGGTAAGCGG CAGGGTCGGA ACAGGAGAGC GCACGAGGGA GCTTCCAGGG
 7201 GGAAACGCCT GGTATCTTTA TAGTCCTGTC GGGTTTCGCC ACCTCTGACT TGAGCGTCGA
 7261 TTTTGTGAT GCTCGTCA

FIGURE 32D

Figure 33A:

pDEST13

Native protein in *E. coli*: λ PL promoter

3721 tgggcaaacc aagacagcta aagatctctc acctaccaa caatgcccc ctgcaaaaaa
 acccgtttgg ttctgtcgat ttctagagag tggatggttt gttacggggg gacgtttttt

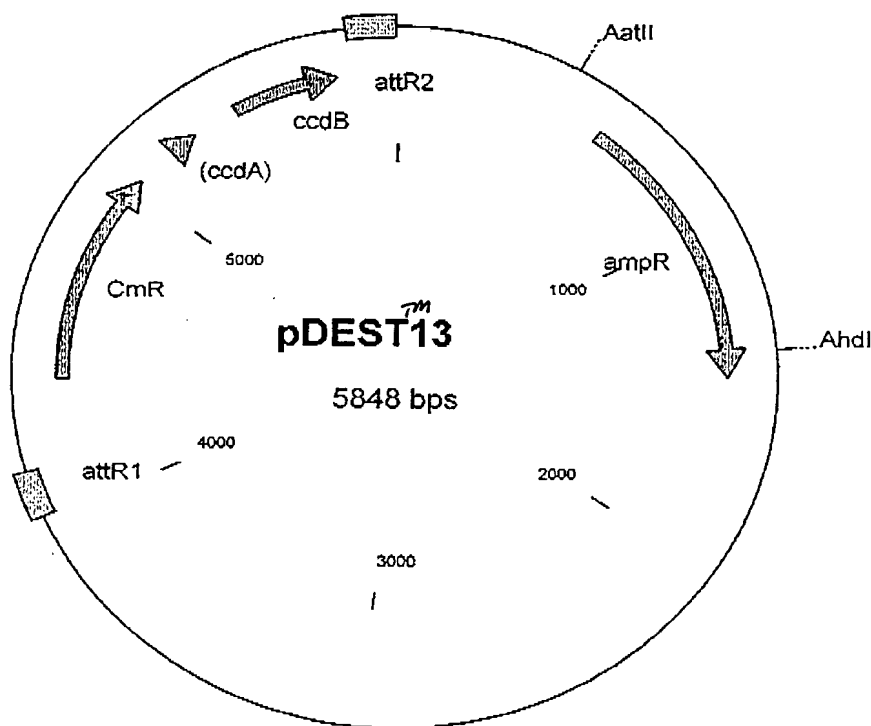
3781 taaattcata taaaaaacat acagataacc atctgcggtg ataaattatc tctggcggtg
 atttaagtat attttttgta tgtctattgg tagacgccac tatttaatag agaccgccac

3841 ttgacataaa taccactggc ggtgatactg agcacatcag caggacgcac tgaccaccat
aactgtattt atggtgaccg ccactatgac tcgtgtagtc gtcctgcggtg actggtggta

3901 gaaggtgacg ctcttaaaaa ttaagecctg aagaaggcca gcattcaaag cagaaggctt
 ctccactgc gagaattttt aattcgggac ttcttcccgt cgtaagtttc gtcttccgaa

3961 tgggggtgtgt gatacgaac gaagcattgg gatcatcaca agtttgtaca aaaaagctga
 accccacaca ctatgctttg cttcgttaacc ctagtagtgt tcaaacatgt ttttcgact

Handwritten annotations:
 -35 λ PL Promoter -10
 BglII
 EcoNI
 att R1
 att R2



pDEST13 5848 bp

Location (Base Nos.)	Gene Encoded
599..1458	ampR
4123..3998	attR1
4372..5031	CmR
5151..5235	inactivated ccdA
5373..5678	ccdB
5719..5843	attR2

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1  TTCACTGGCC  GTCGTTTTAC  AACGTCGTGA  CTGGGAAAAAC  CCTGGCGTTA  CCCAACTTAA
61  TCGCCTTGCA  GCACATCCCC  CTTTCGCCAG  CTGGCGTAAT  AGCGAAGAGG  CCCGCACCGA
121  TCGCCCTTCC  CAACAGTTGC  GCAGCCTGAA  TGGCGAATGG  CGCCTGATGC  GGTATTTTCT
181  CCTTACGCAT  CTGTGCGGTA  TTTTACACCG  CATATGGTGC  ACTCTCAGTA  CAATCTGCTC
241  TGATGCCGCA  TAGTTAAGCC  AGCCCCGACA  CCCGCCAACA  CCCGCTGACG  CGCCCTGACG
301  GGCTTGTCTG  CTCCCGGCAT  CCGCTTACAG  ACAAGCTGTG  ACCGTCTCCG  GGAGCTGCAT
361  GTGTCAGAGG  TTTTCACCGT  CATCACCGAA  ACGCGCGAGA  CGAAAGGGCC  TCGTGATACG
421  CCTATTTTTA  TAGGTTAATG  TCATGATAAT  AATGGTTTCT  TAGACGTCAG  GTGGCACTTT
481  TCGGGGAAAT  GTGCGCGGAA  CCCCTATTTG  TTTATTTTTT  TAAATACATT  CAAATATGTA
541  TCCGCTCATG  AGACAATAAC  CCTGATAAAT  GCTTCAATAA  TATTGAAAAA  GGAAGAGTAT
601  GAGTATTCAA  CATTTCCTGT  TCGCCCTTAT  TCCCTTTTTT  GCGGCATTTT  GCCTTCCTGT
661  TTTTGCTCAC  CCAGAAACGC  TGGTGAAAGT  AAAAGATGCT  GAAGATCAGT  TGGGTGCACG
721  AGTGGGTTAC  ATCGAAGTGG  ATCTCAACAG  CGGTAAGATC  CTTGAGAGTT  TTCGCCCCGA
781  AGAACGTTTT  CCAATGATGA  GCACTTTTAA  AGTTCGCTA  TGTGGCGCGG  TATTATCCCG
841  TATTGACGCC  GGGCAAGAGC  AACTCGGTCG  CCGCATACAC  TATTCTCAGA  ATGACTTGGT
901  TGAGTACTCA  CCAGTCACAG  AAAAGCATCT  TACGGATGGC  ATGACAGTAA  GAGAATTATG
961  CAGTGCTGCC  ATAACCATGA  GTGATAACAC  TGCGGCCAAC  TTACTTCTGA  CAACGATCGG
1021  AGGACCGAAG  GAGCTAACCG  CTTTTTTGCA  CAACATGGGG  GATCATGTAA  CTCGCCTTGA
1081  TCGTTGGGAA  CCGGAGCTGA  ATGAAGCCAT  ACCAAACGAC  GAGCGTGACA  CCACGATGCC
1141  TGTAGCAATG  GCAACAACGT  TGCGCAAACT  ATTAAGTGGC  GAAGTACTTA  CTCTAGCTTC
1201  CCGGCAACAA  TTAATAGACT  GGATGGAGGC  GGATAAAGTT  GCAGGACCAC  TTCTGCGCTC
1261  GGCCCTTCCG  GCTGGCTGGT  TTATTGCTGA  TAAATCTGGA  GCCGGTGAGC  GTGGGTCTCG
1321  CGGTATCATT  GCAGCACTGG  GGCCAGATGG  TAAGCCCTCC  CGTATCGTAG  TTATCTACAC
1381  GACGGGGAGT  CAGGCAACTA  TGGATGAACG  AAATAGACAG  ATCGCTGAGA  TAGGTGCCTC
1441  ACTGATTAAG  CATTGGTAAC  TGTCAGACCA  AGTTTACTCA  TATATACTTT  AGATTGATTT
1501  AAAACTTCAT  TTTTAATTTA  AAAGGATCTA  GGTGAAGATC  CTTTTTGATA  ATCTCATGAC
1561  CAAAATCCCT  TAACGTGAGT  TTTTCGTCCA  CTGAGCGTCA  GACCCCGTAG  AAAAATCAA
1621  AGGATCTTCT  TGAGATCCTT  TTTTCTGCG  CGTAATCTGC  TGCTTGCAAA  CAAAAAACCC
1681  AACGCTACCA  GCGGTGGTTT  GTTTCGCCGA  TCAAGAGCTA  CCAACTCTTT  TTCCGAAGGT
1741  AACTGGCTTC  AGCAGAGCGC  AGATAACAAA  TACTGTTCTT  CTAGTGTAGC  CGTAGTTAGG
1801  CCACCACTTC  AAGAACTCTG  TAGCACCGCC  TACATACCTC  GCTCTGCTAA  TCCTGTTACC
1861  AGTGGCTGCT  GCCAGTGGCG  ATAAGTCGTG  TCTTACCGGG  TTGGACTCAA  GACGATAGTT
1921  ACCGATAAG  GCGCAGCGGT  CGGGCTGAAC  GGGGGGTTTC  TGCACACAGC  CCAGCTTGGA
1981  GCGAACGACC  TACACCGAAC  TGAGATACCT  ACAGCGTGAG  CATTGAGAAA  GCGCCACGCT
2041  TCCCGAAGGG  AGAAAGGCGG  ACAGGTATCC  GGTAAGCGGC  AGGGTCGGAA  CAGGAGAGCG
2101  CACGAGGGAG  CTTCCAGGGG  GAAACGCCTG  GTATCTTTAT  AGTCCTGTCT  GGTTCGCCA
2161  CCTCTGACTT  GAGCGTCGAT  TTTTGTGATG  CTCGTCAGGG  GGGCGGAGCC  TATGGAAAAA
2221  CGCCAGCAAC  GCGGCCTTTT  TACGGTTCCT  GGCCTTTTGC  TGGCCTTTTG  CTCACATGTT
2281  CTTTCCTGCG  TTATCCCCTG  ATTCTGTGGA  TAACCGTATT  ACCGCCTTTG  AGTGAGCTGA
2341  TACCGCTCGC  CGCAGCCGAA  CGACCGAGCG  CAGCGAGTCA  GTGAGCGAGG  AAGCGGAAGA
2401  GCGCCCAATA  CGCAAACCGC  CTCTCCCCGC  GCGTTGGCCG  ATTCATTAAT  GCAGCTGGCA
2461  CGACAGTTT  CCCGACTGGA  AAGCGGGCAG  TGAGCGCAAC  GCAATTAATG  TGAGTTAGCT
2521  CACTCATTAG  GCACCCAGG  CTTTACACTT  TAGTCTCCG  GCTCGTATGT  TGTGTGGAAT
2581  TGTGAGCGGA  TAACAATTTT  ACACAGGAAA  CAGCTATGAC  CATGATTACG  CCAAGCTTGG
2641  CTGCAGGTGA  TGATTATCAG  CCAGCAGAGA  TTAAGGAAAA  CAGACAGGTT  TATTGAGCGC
2701  TTATCTTTCC  CTTTATTTTT  GCTGCGGTAA  GTCGCATAAA  AACCATTCTT  CATAATTCAA

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FIGURE 33B

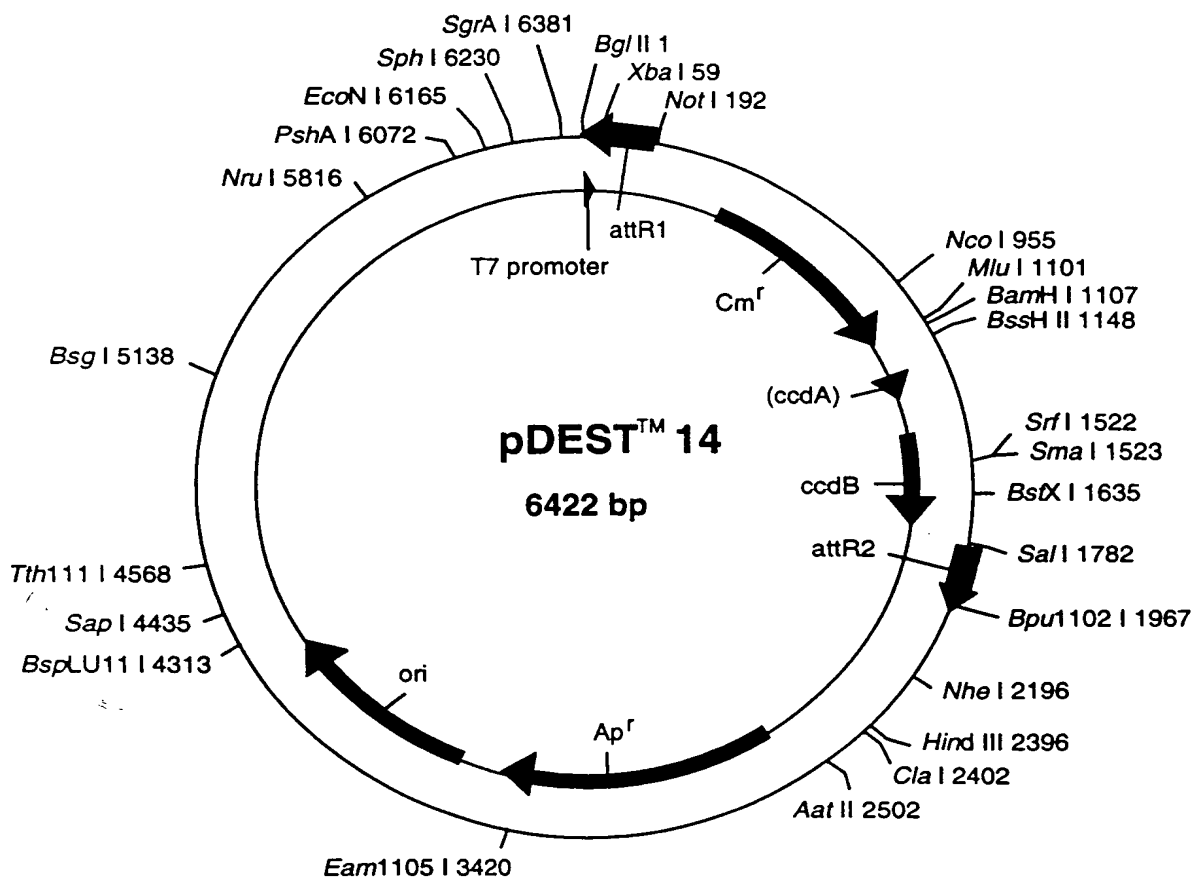
2761 TCCATTTACT ATGTTATGTT CTGAGGGGAG TGAAAATTCC CCTAATTCTGA TGAAGATTCT
2821 TGCTCAATTG TTATCAGCTA TGCGCCGACC AGAACACCTT GCCGATCAGC CAAACGTCTC
2881 TTCAGGCCAC TGACTAGCGA TAACTTTCCC CACAACGGAA CAACTCTCAT TGCATGGGAT
2941 CATTGGGTAC TGTGGGTTTA GTGGTTGTAA AAACACCTGA CCGCTATCCC TGATCAGTTT
3001 CTTGAAGGTA AACTCATCAC CCCCAGTCT GGCTATGCAG AAATCACCTG GCTCAACAGC
3061 CTGCTCAGGG TCAACGAGAA TTAACATTCC GTCAGGAAAG CTTGGCTTGG AGCCTGTTGG
3121 TGCGGTCATG GAATTACCTT CAACCTCAAG CCAGAATGCA GAATCACTGG CTTTTTTGGT
3181 TGTGCTTACC CATCTCTCCG CATCACCTTT GGTAAAGGTT CTAAGCTTAG GTGAGAACAT
3241 CCCTGCCTGA ACATGAGAAA AAACAGGGTA CTCATACTCA CTTCTAAGTG ACGGCTGCAT
3301 ACTAACCGCT TCATACATCT CGTAGATTTT TCTGGCGATT GAAGGGCTAA ATTCTTCAAC
3361 GCTAACTTTG AGAATTTTTG CAAGCAATGC GCGGTTATAA GCATTTAATG CATTGATGCC
3421 ATTAAATAAA GCACCAACGC CTGACTGCCC CATCCCCATC TTGTCTGCGA CAGATTCCTG
3481 GGATAAGCCA AGTTCATTTT TCTTTTTTTT ATAAATTGCT TTAAGGCGAC GTGCGTCCTC
3541 AAGCTGCTCT TGTGTTAATG GTTCTTTTTT TGTGCTCATA CGTTAAATCT ATCACCGCAA
3601 GGGATAAATA TCTAACACCG TGCCTGTTGA CTATTTTACC TCTGGCGGTG ATAATGGTTG
3661 CATGTACTAA GGAGGTTGTA TGGACAACG CATAACCCTG AAAGATTATG CAATGCGCTT
3721 TGGGCAAACC AAGACAGCTA AAGATCTCTC ACCTACCAA CAATGCCCCC CTGCAAAAAA
3781 TAAATTCTA TAAAAAACAT ACAGATAACC ATCTGCGGTG ATAAATTATC TCTGGCGGTG
3841 TTGACATAAA TACCACTGGC GGTGATACTG AGCACATCAG CAGGACGCAC TGACCACCAT
3901 GAAGGTGACG CTCTTAAAAA TTAAGCCCTG AAGAAGGGCA GCATTCAAAG CAGAAGGCTT
3961 TGGGTGTGTG GATACGAAAC GAAGCATTTG GATCATCACA AGTTTGTACA AAAAAGCTGA
4021 ACGAGAAACG TAAATGATA TAAATACAA TATATTAAAT TAGATTTTGC ATAAAAACA
4081 GACTACATAA TACTGTAAAA CACAACATAT CCAGTCACTA TGGCGGCCGC TAAGTTGGCA
4141 GCATCACCCG ACGCACTTTG CGCCGAATAA ATACCTGTGA CGGAAGATCA TTTCGCAGAA
4201 TAAATAAATC CTGGTGTTCC TGTGATACC GGAAGCCCTT GGGCCAACCT TTGGCGAAAA
4261 TGAGACGTTG ATCGGCACGT AAGAGGTTCC AACTTTCACC ATAATGAAAT AAGATCACTA
4321 CCGGGCGTAT TTTTGTAGTT ATCGAGATTT TCAGGAGCTA AGGAAGCTAA AATGGAGAAA
4381 AAAATCACTG GATATACCAC CGTTGATATA TCCCAATGGC ATCGTAAAGA ACATTTTGAG
4441 GCATTTTCTG CAGTTGCTCA ATGTACCTAT AACCAGACCG TTCAGCTGGA TATTACGGCC
4501 TTTTAAAGA CCGTAAAGAA AAATAAGCAC AAGTTTTATC CGGCCTTTAT TCACATTCTT
4561 GCGCGCTGA TGAATGCTCA TCCGGAATTC CGTATGGCAA TGAAAGACGG TGAGCTGGTG
4621 ATATGGGATA GTGTTACCCC TTGTTACACC GTTTTCCATG AGCAAACCTGA AACGTTTTCA
4681 TCGCTCTGGA GTGAATACCA CGACGATTTT CCGCAGTTTC TACACATATA TTCGCAAGAT
4741 GTGGCGTGTT ACGGTGAAAA CCTGGCCTAT TTCCCTAAAG GGTATTATTGA GAATATGTTT
4801 TTCGTCTCAG CCAATCCCTG GGTGAGTTTC ACCAGTTTGT ATTTAAACGT GGCCAATATG
4861 GACAATTCT TCGCCCCCGT TTTCACCATG GGCAAATATT ATACGCAAGG CGACAAGGTG
4921 CTGATGCCGC TGGCGATTCA GGTTCATCAT GCCGTCTGTG ATGGCTTCCA TGTCGGCAGA
4981 ATGCTTAATG AATTACAACA GTACTGCGAT GAGTGGCAGG GCGGGGCGTA AACGCGTGGA
5041 TCCGGCTTAC TAAAAGCCAG ATAACAGTAT GCGTATTTGC GCGCTGATTT TTGCGGTATA
5101 AGAATATATA CTGATATGTA TACCCGAAGT ATGTCAAAAA GAGGTGTGCT ATGAAGCAGC
5161 GTATTACAGT GACAGTTGAC AGCGACAGCT ATCAGTTGCT CAAGGCATAT ATGATGTCAA
5221 TATCTCCGGT CTGGTAAGCA CAACCATGCA GAATGAAGCC CGTCGTCTGC GTGCCGAACG
5281 CTGGAAAGCG GAAAATCAGG AAGGGATGGC TGAGGTGCGC CGGTTTATTG AAATGAACGG
5341 CTCTTTTGCT GACGAGAACA GGGACTGGTG AAATGCAGTT TAAGGTTTAC ACCTATAAAA
5401 GAGAGAGCCG TTATCGTCTG TTTGTGGATG TACAGAGTGA TATTATTGAC ACGCCGGGCG
5461 GACGGATGGT GATCCCCCTG GCCAGTGCAC GTCTGCTGTC AGATAAAGTC TCCCGTGAAC
5521 TTTACCCGGT GGTGCATATC GGGGATGAAA GCTGGCGCAT GATGACCACC GATATGGCCA
5581 GTGTGCCGGT CTCCGTTATC GGGGAAGAAG TGGCTGATCT CAGCCACCGC GAAAATGACA
5641 TCAAAAACGC CATTAACTG ATGTTCTGGG GAATATAAAT GTCAGGCTCC GTTATACACA
5701 GCCAGTCTGC AGGTCGACCA TAGTGACTGG ATATGTTGTG TTTTACAGTA TTATGTAGTC
5761 TGTTTTTTAT GCAAAATCTA ATTTAATATA TTGATATTTA TATCATTTTA CGTTTCTCGT
5821 TCAGCTTTCT TGTACAAAGT GGTGATAA

FIGURE 33C

Figure 34A: pDEST14 Native Protein Expression in *E. coli*, T7 Promoter

```

3961  tgccggccac gatgcgtccg gcgtagagga tcgagatctc gatcccgcga aatPT7taatacg
      acggccggtg ctacgcaggc cgcattctct agctctadag ctagggcgct ttaattatgc
4021  // actcactata gggagaccac aacggtttcc ctctagatca caagtttattR1ta caaaaaagct
      tgagtmRNAgatat ccctctggtg ttgccaaagg gagatctagt gttcaaattR1acat gtttttcga
  
```



pDEST14 6422 bp (rotated to position 4000)

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
185..61	attR1
435..1094	CmR
1214..1298	inactivated ccdA
1436..1741	ccdB
1782..1906	attR2
2632..3489	ampR

```

1 CGATCCCGCG AAATTAATAC GACTCACTAT AGGGAGACCA CAACGGTTTC CCTCTAGATC
61 ACAAGTTTGT ACAAAAAAGC TGAACGAGAA ACGTAAAATG ATATAAATAT CAATATATTA
121 AATTAGATTT TGCATAAAAA ACAGACTACA TAATACTGTA AAACACAACA TATCCAGTCA
181 CTATGGCGGC CGCTAAGTTG GCAGCATCAC CCGACGCACT TTGCGCCGAA TAAATACCTG
241 TGACGGAAGA TCACTTCGCA GAATAAATAA ATCCTGGTGT CCCTGTTGAT ACCGGAAGC
301 CCTGGGCCAA CTTTGGCGA AAATGAGACG TTGATCGGCA CGTAAGAGGT TCCAACTTTC
361 ACCATAATGA AATAAGATCA CTACCGGGCG TATTTTTTGA GTTATCGAGA TTTTCAGGAG
421 CTAAGGAAGC TAAAAATGAG AAAAAAATCA CTGGATATAC CACCGTTGAT ATATCCCAAT
481 GGCATCGTAA AGAACATTTT GAGGCATTTT AGTCAGTTGC TCAATGTACC TATAACCAGA
541 CCGTTCAGCT GGATATTACG GCCTTTTTTAA AGACCGTAAA GAAAAATAAG CACAAGTTTT
601 ATCCGGCCTT TATTCACATT CTTGCCCCGC TGATGAATGC TCATCCGGAA TTCCGTATGG
661 CAATGAAAGA CGGTGAGCTG GTGATATGGG ATAGTGTTCA CCCTTGTTAC ACCGTTTTCC
721 ATGAGCAAAC TGAAACGTTT TCATCGCTCT GGAGTGAATA CCACGACGAT TTCCGGCAGT
781 TTCTACACAT ATATTCGCAA GATGTGGCGT GTTACGGTGA AAACCTGGCC TATTTCCCTA
841 AAGGGTTTAT TGAGAATATG TTTTTCGTCT CAGCCAATCC CTGGGTGAGT TTCACCAGTT
901 TTGATTTAAA CGTGCCCAAT ATGGACAAC TCTTCGCCCC CGTTTTTACC ATGGGCAAAT
961 ATTATACGCA AGGCGACAAG GTGCTGATGC CGCTGGCGAT TCAGGTTTCA CATGCCGTCT
1021 GTGATGGCTT CCATGTCGGC AGAATGCTTA ATGAATTACA ACAGTACTGC GATGAGTGGC
1081 AGGGCGGGGC GTAAACGCGT GGATCCGGCT TACTAAAAGC CAGATAACAG TATGCGTATT
1141 TGCGCGCTGA TTTTTCGCGT ATAAGAATAT ATACTGATAT GTATACCCGA AGTATGTCAA
1201 AAAGAGGTGT GCTATGAAGC AGCGTATTAC AGTGACAGTT GACAGCGACA GCTATCAGTT
1261 GCTCAAGGCA TATATGATGT CAATATCTCC GGTCTGGTAA GCACAACCAT GCAGAATGAA
1321 GCGCGTCGTC TGCGTGCCGA ACGCTGGAAG GCGGAAAATC AGGAAGGGAT GGCTGAGGTC
1381 GCGCGGTTTA TTGAAATGAA CGGCTCTTTT GCTGACGAGA ACAGGGACTG GTGAAATGCA
1441 GTTTAAGGTT TACACCTATA AAAGAGAGAG CCGTTATCGT CTGTTTGTGG ATGTACAGAG
1501 TGATATTATT GACACGCCCC GCGCAGCGAT GGTGATCCCC CTGGCCAGTG CACGTCTGCT
1561 GTCAGATAAA GTCTCCCGTG AACTTTACCC GGTGGTGCAT ATCGGGGATG AAAGCTGGCG
1621 CACTGATGAC ACCGATATGG CCAGTGATGCC GGTCTCCGTT ATCGGGGAAG AAGTGGCTGA
1681 TCTCAGCCAC CGCGAAAATG ACATCAAAAA CGCCATTAACT CTGATGTTCT AGGGAATATA
1741 AATGTCAGGC TCCCTTATAC ACAGCCAGTC TGCAGGTCGA CCATAGTGAC TGGATATGTT
1801 GTGTTTTTACA GTATTATGTA GTCTGTTTTT TATGCAAAAT CTAATTTAAT ATATTGATAT
1861 TTATATCATT TTACGTTTCT CGTTCAGCTT TCTTGTAACA AGTGGTGTAT ATCCGGCTGC
1921 TAACAAAGCC CGAAAGGAAG CTGAGTTGGC TGCTGCCACC GCTGAGCAAT AACTAGCATA
1981 ACCCCTTGGG GCCTCTAAAC GGGTCTTGAG GGGTTTTTTG CTGAAAGGAG GAACTATATC
2041 CGGATATCCA CAGGACGGGT GTGGTCGCCA TGATCGCGTA GTCGATAGTG GCTCCAAGTA
2101 GCGAAGCGAG CAGGACTGGG CGGCGGCCAA AGCGGTCGGA CAGTGCTCCG AGAACGGGTG
2161 CGCATAGAAA TTGCATCAAC GCATATAGCG CTAGCAGCAC GCCATAGTGA CTGGCGATGC
2221 TGTCGGAATG GACGATATCC CGCAAGAGGC CCGGCAGTAC CGGCATAACC AAGCCTATGC
2281 CTACAGCATC CAGGGTGACG GTGCCGAGGA TGACGATGAG CGCATTTGTTA GATTTTCATC
2341 ACGGTGCCTG ACTGCGTTAG CAATTTAACT GTGATAAACT ACCGCATTAA AGCTTATCGA
2401 TGATAAGCTG TCAAACATGA GAATCTTTGA AGACGAAAGG GCCTCGTGAT ACGCCTATTT
2461 TTATAGGTA ATGTCATGTA AATAATGGTT TCTTAGACGT CAGGTGGCAG TTTTCGGGGA
2521 AATGTGCGCG GAACCCCTAT TTGTTTTATT TTCTAAATAC ATTCAAATAT GTATCCGCTC
2581 ATGAGACAAT AACCCCTGATA AATGCTTCAA TAATATTGAA AAAGGAAGAG TATGAGTATT
2641 CAACATTTCC GTGTCGCCCT TATTCCTTTT TTTGCGGCAT TTTGCCCTCC TGTTTTTGCT
2701 CACCCAGAAA CGCTGGTGAA AGTAAAAGAT GCTGAAGATC AGTTGGGTGC ACGAGTGGGT-

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Figure 34B

2761 TACATCGAAC TGGATCTCAA CAGCGGTAAG ATCCTTGAGA GTTTTCGCCC CGAAGAACGT
2821 TTTCCAATGA TGAGCACTTT TAAAGTTCTG CTATGTGGCG CGGTATTATC CCGTGTGAC
2881 GCCGGGCAAG AGCAACTCGG TCGCCGCATA CACTATTCTC AGAATGACTT GGTTGAGTAC
2941 TCACCAGTCA CAGAAAAGCA TCTTACGGAT GGCATGACAG TAAGAGAATT ATGCAGTGCT
3001 GCCATAACCA TGAGTGATAA CACTGCGGCC AACTTACTTC TGACAACGAT CGGAGGACCG
3061 AAGGAGCTAA CCGCTTTTTT GCACAACATG GGGGATCATG TAACTCGCCT TGATCGTTGG
3121 GAACCGGAGC TGAATGAAGC CATACCAAAC GACGAGCGTG ACACCACGAT GCCTGCAGCA
3181 ATGGCAACAA CGTTGCGCAA ACTATTAAC TGGCAACTAC TTACTCTAGC TTCCCGGCAA
3241 CAATTAATAG ACTGGATGGA GCGGATAAAA GTTGCAGGAC CACTTCTGCG CTCGGCCCTT
3301 CCGGCTGGCT GGTTTATTGC TGATAAATCT GGAGCCGGTG AGCGTGGGTC TCGCGGTATC
3361 ATTGCAGCAC TGGGGCCAGA TGGTAAGCCC TCCCGTATCG TAGTTATCTA CACGACGGGG
3421 AGTCAGGCAA CTATGGATGA ACGAAATAGA CAGATCGCTG AGATAGGTGC CTCACTGATT
3481 AAGCATTGGT AACTGTCAGA CCAAGTTTAC TCATATATAC TTTAGATTGA TTTAAACTT
3541 CATTTTTAAT TTAAAAGGAT CTAGGTGAAG ATCCTTTTTG ATAATCTCAT GACCAAAATC
3601 CCTTAACGTG AGTTTTCGTT CCACTGAGCG TCAGACCCCG TAGAAAAGAT CAAAGGATCT
3661 TCTTGAGATC CTTTTTTTCT GCGCGTAATC TGCTGCTTGC AAACAAAAAA ACCACCGCTA
3721 CCAGCGGTGG TTTGTTTGCC GGATCAAGAG CTACCAACTC TTTTTCGAA GGTAAGTGGC
3781 TTCAGCAGAG CGCAGATACC AAATACTGTC CTTCTAGTGT AGCCGTAGTT AGGCCACCAC
3841 TTCAAGAACT CTGTAGCACC GCCTACATAC CTCGCTCTGC TAATCCTGTT ACCAGTGGCT
3901 GCTGCCAGTG GCGATAAGTC GTGCTTACC GGGTTGGACT CAAGACGATA GTTACCGGAT
3961 AAGCGCAGC GGTGCGGCTG AACGGGGGTT TCGTGCACAC AGCCGACTT GTTACCGAACG
4021 ACCTACACCG AACTGAGATA CCTACAGCGT GAGCTATGAG AAAGCGCCAC GCTTCCCGAA
4081 GGGAGAAAAG CGGACAGGTA TCCGGTAAGC GGCAGGGTCG GAACAGGAGA GCGCACGAGG
4141 GAGCTTCCAG GGGGAAACGC CTGGTATCTT TATAGTCCTG TCGGGTTTCG CCACCTCTGA
4201 CTTGAGCGTC GATTTTTGTG ATGCTCGTCA GGGGGGCGGA GCCTATGGAA AAACGCCAGC
4261 AACGCGGCTT TTTTACGGTT CCTGGCCTTT TGCTGGCCTT TTGCTCACAT GTTCTTTTCT
4321 GCGTTATCCC CTGATTCTGT GGATAACCGT ATTACCGCTT TTGAGTGAGC TGATACCGCT
4381 CGCCGACGCC GAACGACCGA GCGCAGCGAG TCAGTGAGCG AGGAAAGCGGA AGAGCGCCTG
4441 ATGCGGTATT TTCTCCTTAC GCATCTGTGC GGTATTTTAC ACCGCATATA TGGTGCATC
4501 TCAGTACAAT CTGCTCTGAT GCCGCATAGT TAAGCCAGTA TACACTCCGC TATCGCTACG
4561 TGACTGGGTC ATGGCTGCGC CCCGACACCC GCCAACACCC GCTGACGCGC CCTGACGGGC
4621 TTGTCTGCTC CCGGCATCCG CTACAGACA AGCTGTGACC GTCTCCGGGA GCTGCATGTG
4681 TCAGAGGTTT TCACCGTCAT CACCGAAACG CGCGAGGCAG CTGCGGTAAA GCTCATCAGC
4741 GTGGTCGTGA AGCGATTAC AGATGTCTGC CTGTTTATCC GCGTCCAGCT CGTTGAGTTT
4801 CTCCAGAAGC GTTAATGTCT GGCTTCTGAT AAAGCGGGCC ATGTTAAGGG CGGTTTTTTC
4861 CTGTTTGGTC ACTGATGCC TCGGTAAAG GGGATTCTG TTCATGGGGG TAATGATACC
4921 GATGAAACGA GAGAGGATGC TCACGATAAG GGTACTGAT GATGAACATG CCCGTTACT
4981 GGAACGTTGT GAGGGTAAAC AACTGGCGGT ATGGATGCGG CGGGACCAGA GAAAAATCAC
5041 TCAGGGTCAA TGCCAGCGCT TCGTTAATAC AGATGTAGGT GTTCCACAGG GTAGCCAGCA
5101 GCATCCTGCG ATGCAGATCC GGAACATAAT GGTGCAGGGC GCTGACTTCC GCGTTTCCAG
5161 ACTTTACGAA ACACGGAAAC CGAAGACCAT TCATGTTGTT GCTCAGGTCG CAGACGTTTT
5221 GCAGCAGCAG TCGCTTACG TTCGCTCGCG TATCGGTGAT TCATTCTGCT AACCAGTAAG
5281 GCAACCCCGC CAGCCTAGCC GGGTCTCTCA CGACAGGAGC ACGATCATGC GCACCCGTGG
5341 CCAGGACCCA ACGCTGCCCC AGATGCGCCG CGTGCGGCTG CTGGAGATGG CGGACGCGAT
5401 GGATATGTTT TGCCAAGGGT TGGTTTGCGC ATTCACAGTT CTCCGCAAGA ATTGATTGGC
5461 TCCAATTCTT GGAGTGGTGA ATCCGTTAGC GAGGTGCCGC CGGCTTCCAT TCAGGTCGAG
5521 GTGGCCCGGC TCCATGCACC GCGACGCAAC GCGGGGAGGC AGACAAGGTA TAGGGCGGCG
5581 CCTACAATCC ATGCCAACCC GTTCCATGTG CTCGCCGAGG CGGCATAAAT CGCCGTGACG
5641 ATCAGCGGTC CAGTGATCGA AGTTAGGCTG GTAAGAGCCG CGAGCGATCC TTGAAGCTGT
5701 CCCTGATGGT CGTCATCTAC CTGCCTGGAG AGCATGGCCT GCAACGCGGG CATCCCGATG
5761 CCGCCGGAAG CGAGAAGAAT CATAATGGGG AAGCCATCC AGCCTCGCGT CGCGAACGCC
5821 AGCAAGACGT AGCCCAGCGC GTCGGCCGCC ATGCCGCGCA TAATGGCCTG CTTCTCGCCG
5881 AAACGTTTGG TGGCGGGACC AGTGACGAAG GCTTGAGCGA GGGCGTGCAA GATTCCGAAT
5941 ACCGCAAGCG ACAGGCCGAT CATCGTCGCG CTCCAGCGAA AGCGGTCTCT GCCGAAAATG
6001 ACCCAGAGCG CTGCCGGCAC CTGTCTTACG AGTTGCATGA TAAAGAAGAC AGTCATAAGT
6061 GCGGCGACGA TAGTCATGCC CCGCGCCAC CGGAAGGAGC TGAAGGGTT GAAGGCTCTC
6121 AAGGGCATCG GTCGATCGAC GCTCTCCCTT ATGCGACTCC TGCATTAGGA AGCAGCCCAG
6181 TAGTAGGTTG AGGCCGTTGA GCACCGCCGC CGCAAGGAAT GGTGCATGCA AGGAGATGGC-

Figure 34C

6241 GCCCAACAGT CCCCCGGCCA CGGGGCCTGC CACCATACCC ACGCCGAAAC AAGCGCTCAT
6301 GAGCCCGAAG TGGCGAGCCC GATCTTCCCC ATCGGTGATG TCGGCGATAT AGGCGCCAGC
6361 AACCGCACCT GTGGCGCCGG TGATGCCGGC CACGATGCGT CCGGCGTAGA GGATCGAGAT
6421 CT

6241 6301 6361 6421

FIGURE 34D

Figure 35A: pDEST15 Glutathione-S-transferase Fusion in *E. coli*, T7 Promoter

mRNA →

T7 Promoter

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1  nat cga gat ctc gat ccc gcg aaa gta ata cga ctc act ata ggg aga cca
   nta gct cta gag cta ggg cgc ttt aat tat gct gag tga tat ccc tct ggt

52  caa cgg ttt ccc tct aga aat aat ttt gtt taa ctt taa gaa gga gat ata
   gtt gcc aaa ggg aga tct tta tta aaa caa att gaa att ctt cct cta tat

103 NdeI | 102 | S P I L | 103 | gta tac agg gga tat gat cca ata acc ttt taa ttc ccg gaa cac gtt ggg
   cat atg ttc cct ata cta ggt tat tgg aaa att aag ggc ctt gtg caa ccc
   ↓ Start Translation GST

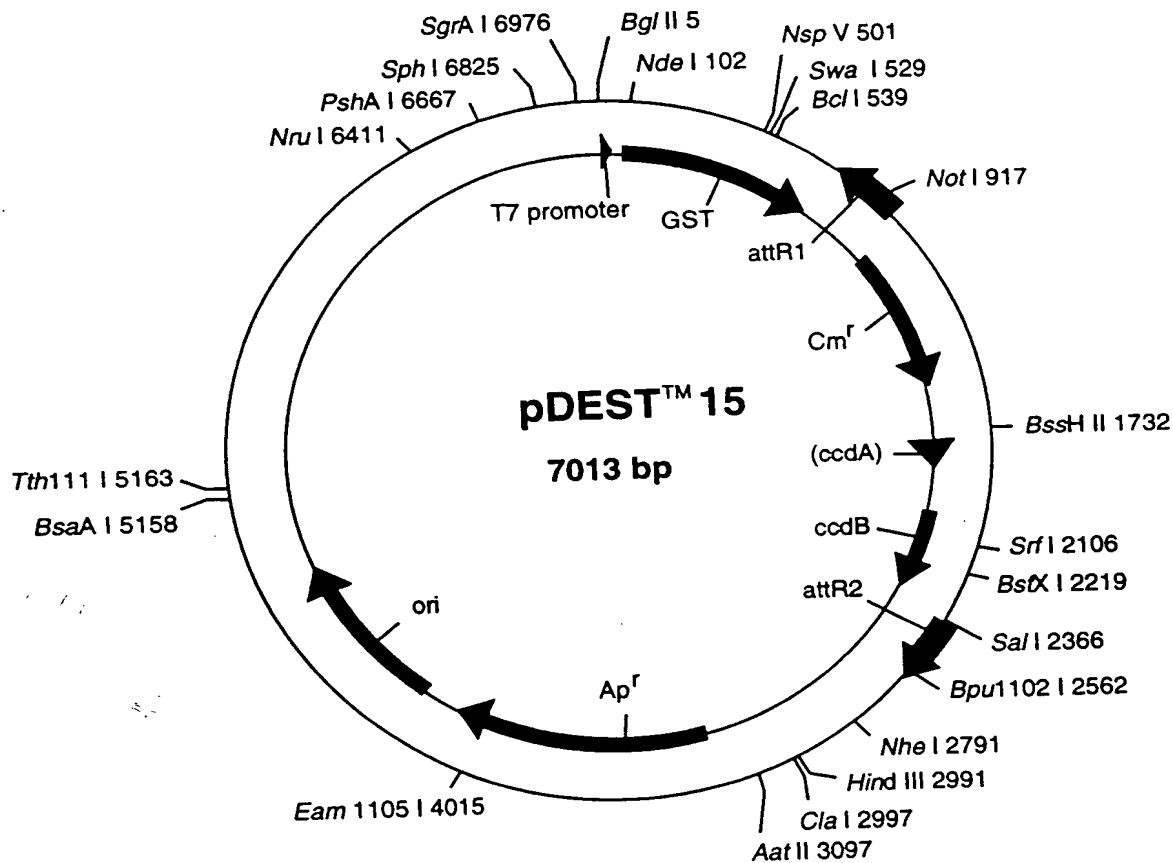
154  act cga ctt ctt ttg gaa tat ctt gaa gaa aaa tat gaa gag cat ttg tat
   tga gct gaa gaa aac ctt ata gaa ctt ctt ttt ata ctt ctc gta aac ata

715  cag ggc tgg caa gcc acg ttt ggt ggt ggc gac cat cct cca aaa tcg gat
   gtc ccg acc gtt cgg tgc aaa cca cca ccg ctg gta gga ggt ttt agc cta

766  ctg gtt ccg cgt cca tgg tgg aat caa aca agt ttg tac aaa aaa gct gaa
   gac caa ggc gca ggt acc agc tta gtt tgt tca aac atg ttt ttt cga ctt

817  cga gaa acg taa aat gat ata aat atc aat ata tta aat tag att ttg cat
   gct ctt tgc att tta cta tat tta tag tta tat aat tta atc taa aac gta
  
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attR1 Int



pDEST15 7013 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
108..776	GST
916..792	attR1
1025..1537	CmR
1804..1888	inactivated ccdA
2026..2331	ccdB
2372..2496	attR2
3233..4093	ampR

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1 ATCGAGATCT CGATCCCGCG AAATTAATAC GACTCACTAT AGGGAGACCA CAACGGTTTC
61 CCTCTAGAAA TAATTTTGT TAACTTTAAG AAGGAGATAT ACATATGTCC CCTATACTAG
121 GTTATTGGAA AATTAAGGGC CTTGTGCAAC CCACTCGACT TCTTTTGGAA TATCTTGAAG
181 AAAAAATATGA AGAGCATTTG TATGAGCGCG ATGAAGGTGA TAAATGGCGA AACAAAAAGT
241 TTGAATTGGG TTTGGAGTTT CCAATCTTC CTTATTATAT TGATGGTGAT GTTAAATTAA
301 CACAGTCTAT GGCCATCATA CGTTATATAG CTGACAAGCA CAACATGTTG GGTGGTTGTC
361 CAAAAGAGCG TGCAGAGATT TCAATGCTTG AAGGAGCGGT TTTGGATATT AGATACGGTG
421 TTTTCGAGAAT TGCATATAGT AAAGACTTTG AAACCTCTCA AGTTGATTTT CTTAGCAAGC
481 TACCTGAAAT GCTGAAAATG TTCGAAGATC GTTTATGTCA TAAAACATAT TTAAATGGTG
541 ATCATGTAAC CCATCCTGAC TTCATGTTGT ATGACGCTCT TGATGTTGTT TTATACATGG
601 ACCCAATGTG CTGGATGCG TTCCCAAAT TAGTTTGT TAAAAACGT ATTGAAGCTA
661 TCCCACAAAT TGATAAGTAC TTGAAATCCA GCAAGTATAT AGCATGGCCT TTGCAGGGCT
721 GGCAAGCCAC GTTTGGTGGT GGCGACCATC CTCCAAAATC GGATCTGGTT CCGCGTCCAT
781 GGTGGAATCA AACAAGTTTG TACAAAAAAG CTGAACGAGA AACGTAAAAT GATATAAATA
841 TCAATATATT AAATTAGATT TTGCATAAAA AACAGACTAC ATAATACTGT AAAACACAAC
901 ATATCCAGTC ACTATGGCGG CCGCATTAGG CACCCAGGC TTTACACTTT ATGCTTCCGG
961 CTCGTATAAT GTGTGGATTT TGAGTTAGGA TCCGTCGAGA TTTTCAGGAG CTAAGGAAGC
1021 TAAAATGGAG AAAAAATCA CTGGATATAC CACCGTTGAT ATATCCCAAT GGCATCGTAA
1081 AGAACATTTT GAGGCATTTT AGTCAGTTGC TCAATGTACC TATAACCAGA CCGTTCAGCT
1141 GGATATTACG GCCTTTTAA AGACCGTAAA GAAAAATAAG CACAAGTTTT ATCCGGCCTT
1201 TATTCACATT CTTGCCC GCC TGATGAATGC TCATCCGGAA TTCCGTATGG CAATGAAAGA
1261 CGGTGAGCTG GTGATATGGG ATAGTGTTC CACTTGTTAC ACCGTTTCC ATGAGCAAAC
1321 TGAAACGTTT TCATCGCTCT GGAGTGAATA CCACGACGAT TTCCGGCAGT TTCTACACAT
1381 ATATTGCAA GATGTGGCGT GTTACGGTGA AAACCTGGCC TATTTCCCTA AAGGGTTTAT
1441 TGAGAATATG TTTTTCGTCT CAGCCAATCC CTGGGTGAGT TTCACAGTT TTGATTTAAA
1501 CGTGGCCAAT ATGGACAAC TCTTCGCCCC CGTTTCACC ATGGGCAAAT ATTATACGCA
1561 AGCGACAAG GTGCTGATGC CGTGGCGAT TCAGGTTTCAT CATGCCGTCT GTGATGGCTT
1621 CCATGTCGGC AGAATGCTTA ATGAATTACA ACAGTACTGC GATGAGTGGC AGGGCGGGGC
1681 GTAATCTAGA GGATCCGGCT TACTAAAAGC CAGATAACAG TATGCGTATT TGC GCGCTGA
1741 TTTTTCGGT ATAAGAATAT ATACTGATAT GTATACCCGA AGTATGTCAA AAAGAGGTGT
1801 GCTATGAAGC AGCGTATTAC AGTGACAGTT GACAGCGACA GCTATCAGTT GCTCAAGGCA
1861 TATATGATGT CAATATCTCC GGTCTGGTAA GCACAACCAT GCAGAATGAA GCCCGTCGTC
1921 TGCGTGCCGA ACGCTGGAAC GCGGAAAATC AGGAAGGGAT GGCTGAGGTC GCCCGGTTTA
1981 TTGAAATGAA CGGCTCTTTT GCTGACGAGA ACAGGGACTG GTGAAATGCA GTTTAAGGTT
2041 TACACCTATA AAAGAGAGAG CCGTTATCGT CTGTTTGTGG ATGTACAGAG TGATATTATT
2101 GACACGCCCG GCGACGGAT GGTGATCCCC CTGGCCAGTG CACGTCTGCT GTCAGATAAA
2161 GTCTCCCGTG AACTTTACCC GGTGGTGCAT ATCGGGGATG AAAGCTGGCG CATGATGACC
2221 ACCGATATGG CCAGTGTGCC GGTCTCCGTT ATCGGGGAAG AAGTGGCTGA TCTCAGCCAC
2281 CGCGAAAATG ACATCAAAAA CGCCATTAC CCATAGTGAC TGGATATGTT GTGTTTTACA
2341 TCCCTTATAC ACAGCCAGTC TGCAGTTCCA CCATAGTGAC TGGATATGTT GTGTTTTACA
2401 GTATTATGTA GTCTGTTTTT TATGCAAAAT CTAATTTAAT ATATTGATAT TTATATCATT
2461 TTACGTTTCT CGTTCAGCTT TCTGTACAA AGTGGTTTGA TTCGACCCGG GATCCGGCTG
2521 CTAACAAAGC CCGAAAGGAA GCTGAGTTGG CTGCTGCCAC CGCTGAGCAA TAACTAGCAT
2581 AACCCTTTGG GGCCTCTAAA CGGGTCTTGA GGGGTTTTTT GCTGAAAGGA GGAATATAT
2641 CCGGATATCC ACAGGACGGG TGTGGTCGCC ATGATCGCGT AGTCGATAGT GGCTCCAAGT-

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FIGURE 35B

2701 AGCGAAGCGA GCAGGACTGG GCGGCGGCCA AAGCGGTCGG ACAGTGCTCC GAGAACGGGT
2761 GCGCATAGAA ATTGCATCAA CGCATATAGC GCTAGCAGCA CGCCATAGTG ACTGGCGATG
2821 CTGTCGGAAT GGACGATATC CCGCAAGAGG CCCGGCAGTA CCGGCATAAC CAAGCCTATG
2881 CCTACAGCAT CCAGGGTGAC GGTGCCGAGG ATGACGATGA GCGCATTGTT AGATTTTATA
2941 CACGGTGCCCT GACTGCGTTA GCAATTTAAC TGTGATAAAC TACCGCATTAA AAGCTTATCG
3001 ATGATAAGCT GTCAAACATG AGAATTCCTG AAGACGAAAG GGCCTCGTGA TACGCCTATT
3061 TTTATAGGTT AATGTCATGA TAATAATGGT TTCTTAGACG TCAGGTGGCA CTTTTCGGGG
3121 AAATGTGCGC GGAACCCCTA TTTGTTTATT TTTCTAAATA CATTCAAATA TGTATCCGCT
3181 CATGAGACAA TAACCCCTGAT AAATGCTTCA ATAATATTGA AAAAGGAAGA GTATGAGTAT
3241 TCAACATTTT CGTGTCGCCC TTATTTCCCTT TTTTGC GGCA TTTTGCCTTC CTGTTTTTTC
3301 TCACCCAGAA ACGCTGGTGA AAGTAAAGA TGCTGAAGAT CAGTTGGGTG CACGAGTGGG
3361 TTACATCGAA CTGGATCTCA ACAGCGGTAA GATCCTTGAG AGTTTTTCGCC CCGAAGAACG
3421 TTTTCCAATG ATGAGCACTT TTAAAGTTCT GCTATGTGGC GCGGTATTAT CCCGTGTTGA
3481 CGCCGGGCAA GAGCAACTCG GTCGCCGCAT ACACTATTCT CAGAATGACT TGGTTGAGTA
3541 CTCACCAGTC ACAGAAAAGC ATCTTACGGA TGGCATGACA GTAAGAGAAT TATGCAGTGC
3601 TGCCATAACC ATGAGTGATA AACTGCGGC CAACTTACTT CTGACAACGA TCGGAGGACC
3661 GAAGGAGCTA ACCGCTTTT TGCACAACAT GGGGGATCAT GTAACCTCGCC TTGATCGTTG
3721 GGAACCGGAG CTGAATGAAG CCATACCAA CGACGAGCGT GACACCACGA TGCCTGCAGC
3781 AATGGCAACA ACGTTGCGCA AACTATTAAC TGGCGAACTA CTTACTCTAG CTTCCCGGCA
3841 ACAATTAATA GACTGGATGG AGGCGGATAA AGTTGCAGGA CCACTTCTGC GCTCGGCCCT
3901 TCCGGCTGGC TGGTTTATTG CTGATAAATC TGGAGCCGGT GAGCGTGGGT CTCGCGGTAT
3961 CATTGTCAGCA CTGGGGCCAG ATGGTGAACC TCCCGTATC GTAGTTATCT ACACAGCGGG
4021 GAGTCAGGCA ACTATGGATG AACGAAATAG ACAGATCGCT GAGATAGGTG CCTCACTGAT
4081 TAAGCATTGG TAACGTCTCAG ACCAAGTTTA CTCATATATA CTTTAGATTG ATTTAAAACT
4141 TCATTTTTTAA TTTAAAAGGA TCTAGGTGAA GATCCTTTTT GATAATCTCA TGACCAAAAT
4201 CCCTTAACGT GAGTTTTTCGT TCCACTGAGC GTCAGACCCC GTAGAAAAGA TCAAAGGATC
4261 TTCTTGAGAT CTTTTTTTTTC TGC CGTAAT CTGCTGCTTG CAAACAAAAA AACCACCGCT
4321 ACCAGCGGTG GTTTGTTTTCG CGGATCAAGA GCTACCAACT CTTTTTCCGA AGGTAACCTG
4381 CTTCAAGAAC TCTGTAGCAC CGCCTACATA CCTCGCTCTG CTAATCCTGT TACCAGTGGC
4441 TGCTGCCAGT GGCGATAAGT CGTGTCTTAC CGGGTTGGAC TCAAGACGAT AGTTACCGGA
4501 TAAGGCGCAG CGGTGCGGCT GAACGGGGGG TTCGTGCACA CAGCCCAGCT TGGAGCGAAC
4561 GACCTACACC GAACGTAGAT ACCTACAGCG TGAGCTATGA GAAAGCGCCA CGCTTCCCGA
4621 AGGGAGAAAG GCGGACAGGT ATCCGGTAAG CCGCAGGGTC GGAACAGGAG AGCGCACGAG
4681 GGAGCTTCCA GGGGGAACG CCTGGTATCT TTATAGTCCT GTCGGGTTTC GCCACCTCTG
4741 ACTTGAGCGT CGATTTTTGT GATGCTCGTC AGGGGGGCGG AGCCTATGGA AAAACCTCCAG
4801 CAACGCGGCC TTTTACGGT TCCTGGCCTT TTGCTGGCCT TTTGCTCACA TGTCTTTTCC
4861 TGCGTTATCC CCTGATTCTG TGGATAACCG TATTACCGCC TTTGAGTGAG CTGATACCGC
4921 TCGCCGCAGC CGAACGACCG AGCGCAGCGA GTCAGTGAGC GAGGAAGCGG AAGAGCGCCT
4981 GATGCGGTAT TTTCTCCTTA CGCATCTGTG CCGTATTTCA CACCGCATAT ATGGTGCATC
5041 CTCAGTACAA TCTGCTCTGA TGCCGCATAG TTAAGCCAGT ATACACTCCG CTATCGCTAC
5101 GTGACTGGGT CATGGCTGCG CCCCACACCG CGCCAACACC CGCTGACGCG CCCTGACGGG
5161 CTTGTCTGCT CCCGGCATCC GCTTACAGAC AAGCTGTGAC CGTCTCCGGG AGCTGCATGT
5221 GTCAGAGGTT TTCACCGTCA TCACCGAAAC GCGCGAGGCA GCTGCGGTAA AGCTCATCAG
5281 CGTGGTCGTG AAGCGATTCA CAGATGTCTG CCTGTTTCATC CGCGTCCAGC TCGTTGAGTT
5341 TCTCCAGAA GCGTTAATGTC TGGCTTCTGA TAAAGCGGGC CATGTTAAGG GCGGTTTTTT
5401 CCTGTTTGGT CACTGATGCC TCCGTGTAAG GGGGATTTCT GTTCATGGGG GTAATGATAC
5461 CGATGAAACG AGAGAGGATG CTCACGATAC GGGTTACTGA TGATGAACAT GCCCGGTTAC
5521 TGGAACGTTG TGAGGGTAAA CAACTGGCGG TATGGATGCG GCGGGACCAG AGAAAAATCA
5581 CTCAGGTCAT ATGCCAGCGC TTCGTTAATA CAGATGTAGG TGTTCCACAG GGTAGCCAGC
5641 AGCATCCTGC GATGCAGATC CGGAACATAA TGGTGCAGGG CGCTGACTTC CGGCTTTCCA
5701 GACTTTACGA AACACGGAAA CCGAAGACCA TTCATGTTGT TGCTCAGGTC GCAGACGTTT
5761 TGCAGCAGCA GTCGCTTCAC GTTCGCTCGC GTATCGGTGA TTCATTCTGC TAACCAGTAA
5821 GGCAACCCCG CCAGCCTAGC CGGGTCTTCA ACGACAGGAG CACGATCATG CGCACCCGTG
5881 GCCAGGACCC AACGCTGCCC GAGATGCGCC GCGTGCGGCT GCTGGAGATG GCGGACGCGA
5941 TGGATATGTT CTGCCAAGGG TTGGTTTTCG CATTACAGT TCTCCGCAAG AATTGATTGG
6001 CTCCAATTCT TGGAGTGGTG AATCCGTTAG CGAGGTGCCG CCGGCTTCCA TTCAGGTCGA
6061 GGTGGCCCGG CTCCATGCAC CGCGACGCAA CGCGGGGAGG CAGACAAGGT ATAGGGCGGC-

FIGURE 35C

6181	GCCTACAATC	CATGCCAACC	CGTTCCATGT	GCTCGCCGAG	GCGGCATAAA	TCGCCGTGAC
6241	GATCAGCGGT	CCAGTGATCG	AAGTTAGGCT	GGTAAGAGCC	GCGAGCGATC	CTTGAAGCTG
6301	TCCCTGATGG	TCGTCACTA	CCTGCCTGGA	CAGCATGGCC	TGCAACGCGG	GCATCCCGAT
6361	GCCGCCGGAA	GCGAGAAGAA	TCATAATGGG	GAAGGCCATC	CAGCCTCGCG	TCGCGAACGC
6421	CAGCAAGACG	TAGCCCAGCG	CGTCGGCCGC	CATGCCGGCG	ATAATGGCCT	GCTTCTCGCC
6481	GAAACGTTTG	GTGGCGGGAC	CAGTGACGAA	GGCTTGAGCG	AGGGCGTGCA	AGATTCCGAA
6541	TACCGCAAGC	GACAGGCCGA	TCATCGTCGC	GCTCCAGCGA	AAGCGGTCTT	CGCCGAAAAT
6601	GACCCAGAGC	GCTGCCGGCA	CCTGTCCTAC	GAGTTGCATG	ATAAAGAAGA	CAGTCATAAG
6661	TGCGGCGACG	ATAGTCATGC	CCCCGCCCAA	CCGGAAGGAG	CTGACTGGGT	TGAAGGCTCT
6721	CAAGGGCATC	GGTCGATCGA	CGCTCTCCCT	TATGCGACTC	CTGCATTAGG	AAGCAGCCCA
6781	GTAGTAGGTT	GAGGCCGTTG	AGCACCGCCG	CCGCAAGGAA	TGGTGCATGC	AAGGAGATGG
6841	CGCCCAACAG	TCCCCCGGCC	ACGGGGCCTG	CCACCATAACC	CACGCCGAAA	CAAGCGCTCA
6901	TGAGCCCGAA	GTGGCGAGCC	CGATCTTCCC	CATCGGTGAT	GTCGGCGATA	TAGGCGCCAG
6961	CAACCGCACC	TGTGGCGCCG	GTGATGCCGG	CCACGATGCG	TCCGGCGTAG	AGG

Table 1 *Summary of the data sets used in the study*

Dataset	Number of subjects	Number of trials	Number of conditions	Number of trials per condition
Experiment 1	12	120	12	10
Experiment 2	12	120	12	10
Experiment 3	12	120	12	10
Experiment 4	12	120	12	10
Experiment 5	12	120	12	10
Experiment 6	12	120	12	10
Experiment 7	12	120	12	10
Experiment 8	12	120	12	10
Experiment 9	12	120	12	10
Experiment 10	12	120	12	10
Experiment 11	12	120	12	10
Experiment 12	12	120	12	10
Experiment 13	12	120	12	10
Experiment 14	12	120	12	10
Experiment 15	12	120	12	10
Experiment 16	12	120	12	10
Experiment 17	12	120	12	10
Experiment 18	12	120	12	10
Experiment 19	12	120	12	10
Experiment 20	12	120	12	10
Experiment 21	12	120	12	10
Experiment 22	12	120	12	10
Experiment 23	12	120	12	10
Experiment 24	12	120	12	10
Experiment 25	12	120	12	10
Experiment 26	12	120	12	10
Experiment 27	12	120	12	10
Experiment 28	12	120	12	10
Experiment 29	12	120	12	10
Experiment 30	12	120	12	10
Experiment 31	12	120	12	10
Experiment 32	12	120	12	10
Experiment 33	12	120	12	10
Experiment 34	12	120	12	10
Experiment 35	12	120	12	10
Experiment 36	12	120	12	10
Experiment 37	12	120	12	10
Experiment 38	12	120	12	10
Experiment 39	12	120	12	10
Experiment 40	12	120	12	10
Experiment 41	12	120	12	10
Experiment 42	12	120	12	10
Experiment 43	12	120	12	10
Experiment 44	12	120	12	10
Experiment 45	12	120	12	10
Experiment 46	12	120	12	10
Experiment 47	12	120	12	10
Experiment 48	12	120	12	10
Experiment 49	12	120	12	10
Experiment 50	12	120	12	10
Experiment 51	12	120	12	10
Experiment 52	12	120	12	10
Experiment 53	12	120	12	10
Experiment 54	12	120	12	10
Experiment 55	12	120	12	10
Experiment 56	12	120	12	10
Experiment 57	12	120	12	10
Experiment 58	12	120	12	10
Experiment 59	12	120	12	10
Experiment 60	12	120	12	10
Experiment 61	12	120	12	10
Experiment 62	12	120	12	10
Experiment 63	12	120	12	10
Experiment 64	12	120	12	10
Experiment 65	12	120	12	10
Experiment 66	12	120	12	10
Experiment 67	12	120	12	10
Experiment 68	12	120	12	10
Experiment 69	12	120	12	10
Experiment 70	12	120	12	10
Experiment 71	12	120	12	10
Experiment 72	12	120	12	10
Experiment 73	12	120	12	10
Experiment 74	12	120	12	10
Experiment 75	12	120	12	10
Experiment 76	12	120	12	10
Experiment 77	12	120	12	10
Experiment 78	12	120	12	10
Experiment 79	12	120	12	10
Experiment 80	12	120	12	10
Experiment 81	12	120	12	10
Experiment 82	12	120	12	10
Experiment 83	12	120	12	10
Experiment 84	12	120	12	10
Experiment 85	12	120	12	10
Experiment 86	12	120	12	10
Experiment 87	12	120	12	10
Experiment 88	12	120	12	10
Experiment 89	12	120	12	10
Experiment 90	12	120	12	10
Experiment 91	12	120	12	10
Experiment 92	12	120	12	10
Experiment 93	12	120	12	10
Experiment 94	12	120	12	10
Experiment 95	12	120	12	10
Experiment 96	12	120	12	1

FIGURE 351)

Figure 36A: γ DEST16

Thioredoxin N-Fusion Protein in E. coli with T7 Promoter

1 gat ctc gat ccc gcg aaa tta ata cga ctc act ata ggg aga cca caa cgg
cta gag cta ggg cgc ttt aat tat gct gag tga tat ccc tct ggt gtt gcc

52 ttt ccc tct aga aat aat ttt gtt taa ctt taa gaa gga gat ata cat atg Start
aaa ggg aga tct tta tta aaa caa att gaa att ctt cct cta tat gta gac Translation Trx

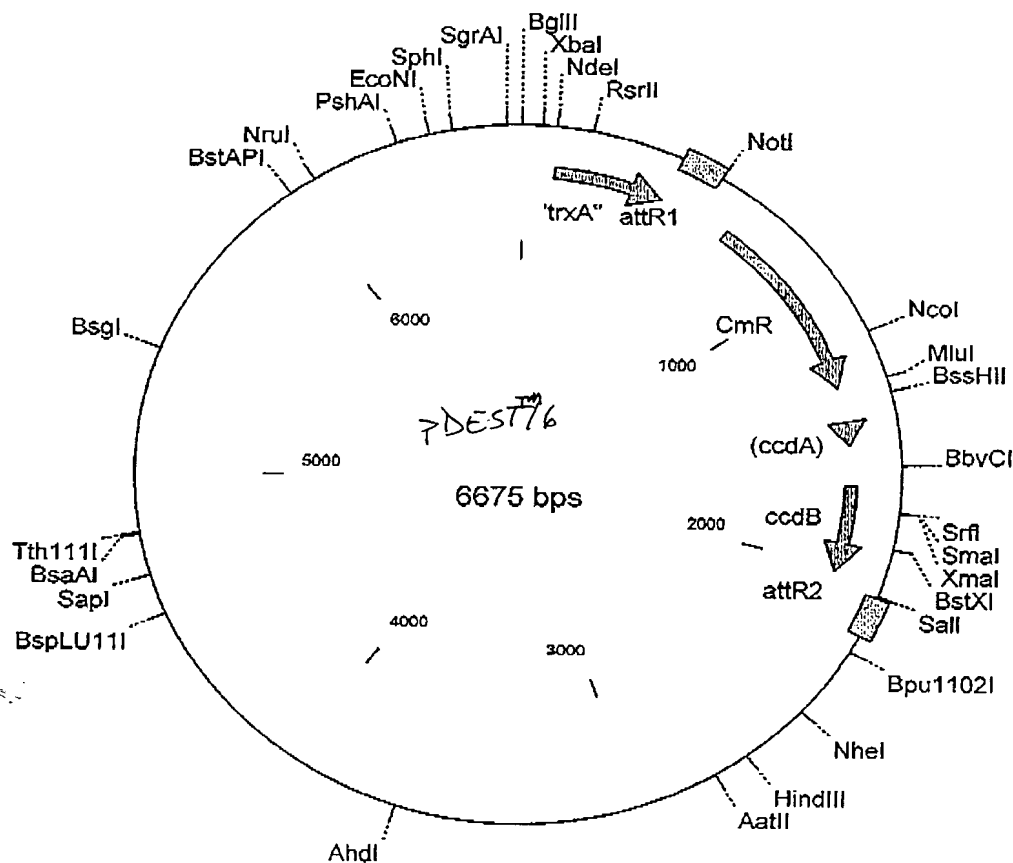
103 S D K - - -
agc gat aaa att att cac ctg act gac gac agt ttt gac acg gat gta ctc
tcg cta ttt taa taa gtg gac tga ctg ctg tca aaa ctg tgc cta cat gag

//-358 gtg gcg gca acc aaa gtg ggt gca ctg tct aaa ggt cag ttg aaa gag ttc
cac cgc cgt tgg ttt cac cca cgt gac aga ttt cca gtc aac ttt ctc aag

409 ctc gac gct aac ctg gcc ggt tct ggt tct ggt gat gac gat gac aag atc
gag ctg cga ttg gac cgg cca aga cca aga cca cta ctg cta ctg ttc tag

460 T S L Y K K A attR1
aca agt ttg tac aaa aaa gct gaa cga gaa acg taa aat gat ata aat atc
tgt tca aac atg ttt ttt cga ctt gct ctt tgc att tta cta tat tta tag

Int



05347466-030000

pDEST16 6675 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
104..457	trxA
585..461	attR1
694..1353	CmR
1473..1557	inactivated ccdA
1695..2000	ccdB
2041..2165	attR2

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1 AGATCTCGAT CCCGCGAAAT TAATACGACT CACTATAGGG AGACCACAAC GGTTCCTC
61 TAGAAATAAT TTTGTTTAAC TTAAAGAAGG AGATATACAT ATGAGCGATA AAATTATCA
121 CCTGACTGAC GACAGTTTGT ACACGGATGT ACTCAAAGCG GACGGGGCGA TCCTCGTCGA
181 TTTCTGGGCA GAGTGGTGCG GTCCGTGCAA AATGATCGCC CCGATTCTGG ATGAAATCGC
241 TGACGAATAT CAGGGCAAAC TGACCGTTGC AAAACTGAAC ATCGATCAAA ACCCTGGCAC
301 TGCGCCGAAA TATGGCATCC GTGGTATCCC GACTCTGCTG CTGTTCAAAA ACGGTGAAGT
361 GCGCGCAACC AAAGTGGGTG CACTGTCTAA AGGTCAGTTG AAAGAGTTCC TCGACGCTAA
421 CCTGGCCGGT TCTGGTTCTG GTGATGACGA TGACAAGATC ACAAGTTTGT AAAAAAAGC
481 TGAACGAGAA ACGTAAAAATG ATATAAATAT CAATATATTA AATTAGATTT TGCATAAAAA
541 ACAGACTACA TAATACTGTA AAACACAACA TATCCAGTCA CTATGGCGGC CGCATTAGGC
601 ACCCCAGGCT TTACACTTTA TGCTTCCGGC TCGTATAATG TGTGGATTTT GAGTTAGGAT
661 CCGGCGAGAT TTTCAGGAGC TAAGGAAGCT AAAATGGAGA AAAAAATCAC TGGATATACC
721 ACCGTTGATA TATCCCAATG GCATCGTAAA GAACATTTTG AGGCATTTCA GTCAGTTGCT
781 CAATGTACCT ATAACCAGAC CGTTCAGCTG GATATTACGG CCTTTTAAA GACCGTAAAG
841 AAAAATAAGC ACAAGTTTTA TCCGGCCTTT ATTACATTTC TTGCCGCCT GATGAATGCT
901 CATCCGGAAT TCCGTATGGC AATGAAAAGC GGTGAGCTGG TGATATGGGA TAGTGTTCAC
961 CCTTGTTACA CCGTTTTCCA TGAGCAAAC TAAACGTTTT CATCGCTCTG GAGTGAATAC
1021 CACGACGATT TCCGGCAGTT TCTACACATA TATTCGCAAG ATGTGGCGTG TTACGGTGAA
1081 AACCTGGCCT ATTTCCCTAA AGGGTTTATT GAGAATATGT TTTTCGTCTC AGCCAATCCC
1141 TGGGTGAGTT TCACCAGTTT TGATTTAAAC GTGGCCAATA TGGACAACCT CTTGCCCCC
1201 GTTTTCACCA TGGGCAAATA TTATACGCAA GCGGACAAGG TGCTGATGCC GCTGGCGATT
1261 CAGGTTTCATC ATGCCGTCTG TGATGGCTTC CATGTCGGCA GAATGCTTAA TGAATTACAA
1321 CAGTACTGCG ATGAGTGGCA GGGCGGGGCG TAAACGCGTG GATCCGGCTT ACTAAAAGCC
1381 AGATAACAGT ATGCGTATTT GCGCGCTGAT TTTGCGGTA TAAGAATATA TACTGATATG
1441 TATACCCGAA GTATGTCAAA AAGAGGTGTG CTATGAAGCA GCGTATTACA GTGACAGTTG
1501 ACAGCGACAG CTATCAGTTG CTCAAGGCAT ATATGATGTC AATATCTCCG GTCTGGTAAG
1561 CACAACCATG CAGAATGAAG CCCGTCGTCT GCGTGCCGAA CGCTGGAAG CGGAAAATCA
1621 GGAAGGGATG GCTGAGGTG CCCGGTTTAT TGAAATGAAC GGCTCTTTTG CTGACGAGAA
1681 CAGGGATGG TGAAATGCAG TTAAAGGTTT ACACCTATAA AAGAGAGAGC CGTTATCGTC
1741 TGTTTGTGGA TGTACAGAGT GATATTATTG ACACGCCCCG GCGACGGATG GTGATCCCCC
1801 TGGCCAGTGC ACGTCTGCTG TCAGATAAAG TCTCCCGTGA ACTTTACCCG GTGGTGCATA
1861 TCGGGGATGA AAGCTGGCGC ATGATGACCA CCGATATGGC CAGTGTGCCG GTCTCCGTTA
1921 TCGGGGAAGA AGTGGCTGAT CTCAGCCACC GCGAAAATGA CATCAAAAAC GCCATTAACC
1981 TGATGTTCTG GGAATATAA ATGTCAGGCT CCCTTATACA CAGCCAGTCT GCAGGTCGAC
2041 CATAGTGAAT GGATATGTTG TGTTTTACAG TATTATGTAG TCTGTTTTTT ATGCAAAATC
2101 TAATTTAATA TATTGATATT TATATCATTT TACGTTTCTC GTTCAGCTTT CTTGTACAAA
2161 GTGGTGATGA TCCGGCTGCT AACAAAGCCC GAAAGGAAGC TGAGTTGGCT GCTGCCACCG
2221 CTGAGCAATA ACTAGCATAA CCCCTTGGGG CCTCTAAACG GGTCTTGAGG GGTTTTTTGC
2281 TGAAAGGAGG AACTATATCC GGATATCCAC AGGACGGGTG TGGTCGCCAT GATCGCGTAG
2341 TCGATAGTGG CTCCAAGTAG CGAAGCGAGC AGGACTGGGC GCGGCCAAA GCGTCCGGAC
2401 AGTGCTCCGA GAACGGGTGC GCATAGAAAT TGCATCAACG CATATAGCGC TAGCAGCACG
2461 CCATAGTGAC TGGCGATGCT GTCGGAATGG ACGATATCCC GCAAGAGGCC CGGCAGTACC
2521 GGCATAACCA AGCCTATGCC TACAGCATCC AGGGTGACGG TGCCGAGGAT GACGATGAGC
2581 GCATTGTTAG ATTTATACA CGTGCTCTGA CTGCGTTAGC AATTAACTG TGATAAACTA
2641 CCGCATTAAG GCTTATCGAT GATAAGCTGT CAAACATGAG AATTCTTGAA GACGAAAGGG
2701 CCTCGTGATA CGCCTATTTT TATAGGTTAA TGTATGATA ATAATGGTTT CTTAGACGTC
2761 AGGTGGCACT TTTCGGGGAA ATGTGCGCGG AACCCCTATT TGTTTATTTT TCTAAATACA-

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Figure 36B

2821 TTCAAATATG TATCCGCTCA TGAGACAATA ACCCTGATAA ATGCTTCAAT AATATTGAAA
2881 AAGGAAGAGT ATGAGTATTC AACATTTCCG TGTCGCCCTT ATTCCCTTTT TTGCGGCATT
2941 TTGCCTTCCCT GTTTTTTGCTC ACCCAGAAAC GCTGGTGAAA GTAAAAGATG CTGAAGATCA
3001 GTTGGGTGCA CGAGTGGGTT ACATCGAACT GGATCTCAAC AGCGGTAAGA TCCTTGAGAG
3061 TTTTCGCCCC GAAGAACGTT TTCCAATGAT GAGCACTTTT AAAGTTCTGC TATGTGGCGC
3121 GGTATTATCC CGTGTGACG CCGGGCAAGA GCAACTCGGT CGCCGCATAC ACTATTCTCA
3181 GAATGACTTG GTTGAGTACT CACCAGTCAC AGAAAAGCAT CTTACGGATG GCATGACAGT
3241 AAGAGAATTA TGCAGTGCTG CCATAACCAT GAGTGATAAC ACTGCGGCCA ACTTACTTCT
3301 GACAACGATC GGAGGACCGA AGGAGCTAAC CGCTTTTTTG CACAACATGG GGGATCATGT
3361 AACTCGCCTT GATCGTTGGG AACCGGAGCT GAATGAAGCC ATACCAAACG ACGAGCGTGA
3421 CACCACGATG CCTGCAGCAA TGGCAACAAC GTTGCGCAAA CTATTAACTG GCGAACTACT
3481 TACTCTAGCT TCCCGGCAAC AATTAATAGA CTGGATGGAG GCGGATAAAG TTGCAGGACC
3541 ACTTCTGCGC TCGGCCCTTC CGGCTGGCTG GTTTATTGCT GATAAATCTG GAGCCGGTGA
3601 GCGTGGGTCT CGCGGTATCA TTGCAGCACT GGGGCCAGAT GGTAAGCCCT CCCGTATCGT
3661 AGTTATCTAC ACGACGGGGA GTCAGGCAAC TATGGATGAA CGAAATAGAC AGATCGCTGA
3721 GATAGGTGCC TCAC TGATTA AGCATTGGTA ACTGTCAGAC CAAGTTTACT CATATATACT
3781 TTAGATTGAT TTAAAACTTC ATTTTAAATT TAAAAGGATC TAGGTGAAGA TCCTTTTTGA
3841 TAATCTCATG ACCAAAATCC CTTAACGTGA GTTTTCGTTT CACTGAGCGT CAGACCCCGT
3901 AGAAAAGATC AAAGGATCTT CTTGAGATCC TTTTCTCTG CGCGTAATCT GCTGCTTGCA
3961 AACAAAAAAA CCACCGTAC CAGCGGTGGT TTGTTTGCCG GATCAAGAGC TACCAACTCT
4021 TTTTCCGAAG GTAACGTGCT TCAGCAGAGC GCAGATACCA AATACTGTCC TTCTCTGTGA
4081 GCCGTAGTTA GGCCACCACT TCAAGAACTC TGTAGCACCG CCTACATACC TCGCTCTGCT
4141 AATCCTGTTA CCAGTGGCTG CTGCCAGTGG CGATAAGTCG TGTCTTACCG GGTGGACTC
4201 AAGACGATAG TTACCGGATA AGGCGCAGCG GTCGGGCTGA ACGGGGGGTT CGTGCACACA
4261 GCCCAGCTTG GAGCGAACGA CCTACACCGA ACTGAGATAC CTACAGCGTG AGCTATGAGA
4321 AAGCGCCACG CTTCCCGAAG GGAGAAAGGC GGACAGGTAT CCGGTAAGCG GCAGGGTCGG
4381 AACAGGAGAG CGCACGAGGG AGCTTCCAGG GGGAAACGCC TGGTATCTTT ATAGTCCTGT
4441 CGGGTTTCGC CACCTCTGAC TTGAGCGTCG ATTTTGTGA TGCTCGTCAG GGGGGCGGAG
4501 CCTATGAAA AACGCCAGCA ACGCGGCCTT TTTACGGTTC CTGGCCTTTT GCTGGCCTTT
4561 TGCTCACATG TTCTTTCCTG CGTTATCCCC TGATTCTGTG GATAACCGTA TTACCGCCTT
4621 TGAGTGAGCT GATACCGCTC GCCGCAGCCG AACGACCGAG CGCAGCGAGT CAGTGAGCGA
4681 GGAAGCGGAA GAGCGCCTGA TGCGGTATTT TCTCCTTACG CATCTGTGCG GTATTTTACA
4741 CCGCATATAT GGTGCACTCT CAGTACAATC TGCTCTGATG CCGCATAGTT AAGCCAGTAT
4801 ACACCTCCGCT ATCGCTACGT GACTGGGTCA TGGCTGCGCC CCGACACCCG CCAACACCCG
4861 CTGACGCGCC CTGACGGGCT TGTCTGCTCC CGGCATCCGC TTACAGACAA GCTGTGACCG
4921 TCTCCGGGAG CTGCATGTGT CAGAGGTTTT CACCGTCATC ACCGAAACGC GCGAGGCAGC
4981 TGCGGTAAAG CTCATCAGCG TGGTCGTGAA GCGATTACCA GATGTCTGCC TGTTCATCCG
5041 CGTCCAGCTC GTTGAGTTTC TCCAGAAGCG TTAATGTCTG GCTTCTGATA AAGCGGGCCA
5101 TGTTAAGGGC GGTTTTTTCC TGTTTGGTCA CTGATGCCTC CGTGTAAGGG GGATTTCTGT
5161 TCATGGGGGT AATGATACCG ATGAAACGAG AGAGGATGCT CACGATACGG GTTACTGATG
5221 ATGAACATGC CCGGTTACTG GAACGTTGTG AGGGTAAACA ACTGGCGGTA TGGATGCGGC
5281 GGGACCAGAG AAAAATCACT CAGGGTCAAT GCCAGCGCTT CGTTAATACA GATGTAGGTG
5341 TTCCACAGGG TAGCCAGCAG CATCCTGCGA TGCAGATCCG GAACATAATG GTGCAGGGCG
5401 CTGACTTCCG CGTTTCCAGA CTTTACGAAA CACGGAAACC GAAGACCATT CATGTTGTTG
5461 CTCAGGTGCG AGACGTTTTG CAGCAGCAGT CGCTTCACGT TCGCTCGCGT ATCGGTGATT
5521 CATCTGCTA ACCAGTAAGG CAACCCCGCC AGCCTAGCCG GGTCCCTAAC GACAGGAGCA
5581 CGATCATGCG CACCCGTGGC CAGGACCCAA CGCTGCCCGA GATGCGCCGC GTGCGGCTGC
5641 TGGAGATGGC GGACGCGATG GATATGTTCT GCCAAGGGTT GGTTTGCGCA TTCACAGTTC
5701 TCCGCAAGAA TTGATTGGCT CCAATTCTTG GAGTGGTGAA TCCGTTAGCG AGGTGCCGCC
5761 GGCTTCCATT CAGGTCGAGG TGGCCCCGCT CCATGCACCG CGACGCAACG CCGGGAGGCA
5821 GACAAGGTAT AGGGCGGCGC TCACAATCCA TGCCAACCCG TTCCATGTGT TCGCCGAGGC
5881 GGCATAAATC GCCGTGACGA TCAGCGGTCC AGTGATCGAA GTTAGGCTGG TAAGAGCCGC
5941 GAGCGATCCT TGAAGCTGTC CCTGATGGTC GTCATCTACC TGCTTGACGA GCATGGCCTG
6001 CAACGCGGGC ATCCCGATGC CGCCGGAAGC GAGAAGAATC ATAATGGGGA AGGCCATCCA
6061 GCCTCGCGTC GCGAACGCCA GCAAGACGTA GCCCAGCGCG TCGGCCGCCA TGCCGGCGAT
6121 AATGGCCTGC TTCTCGCCGA AACGTTTGGT GGCGGGACCA GTGACGAAGG CTTGAGCGAG
6181 GGCGTGCAAG ATTCCGAATA CCGCAAGCGA CAGGCCGATC ATCGTCGCGC TCCAGCGAAA
6241 GCGGTCCTCG CCGAAAATGA CCCAGAGCGC TGCCGGCACC TGTCTTACGA GTTGCATGAT-

FIGURE 36C

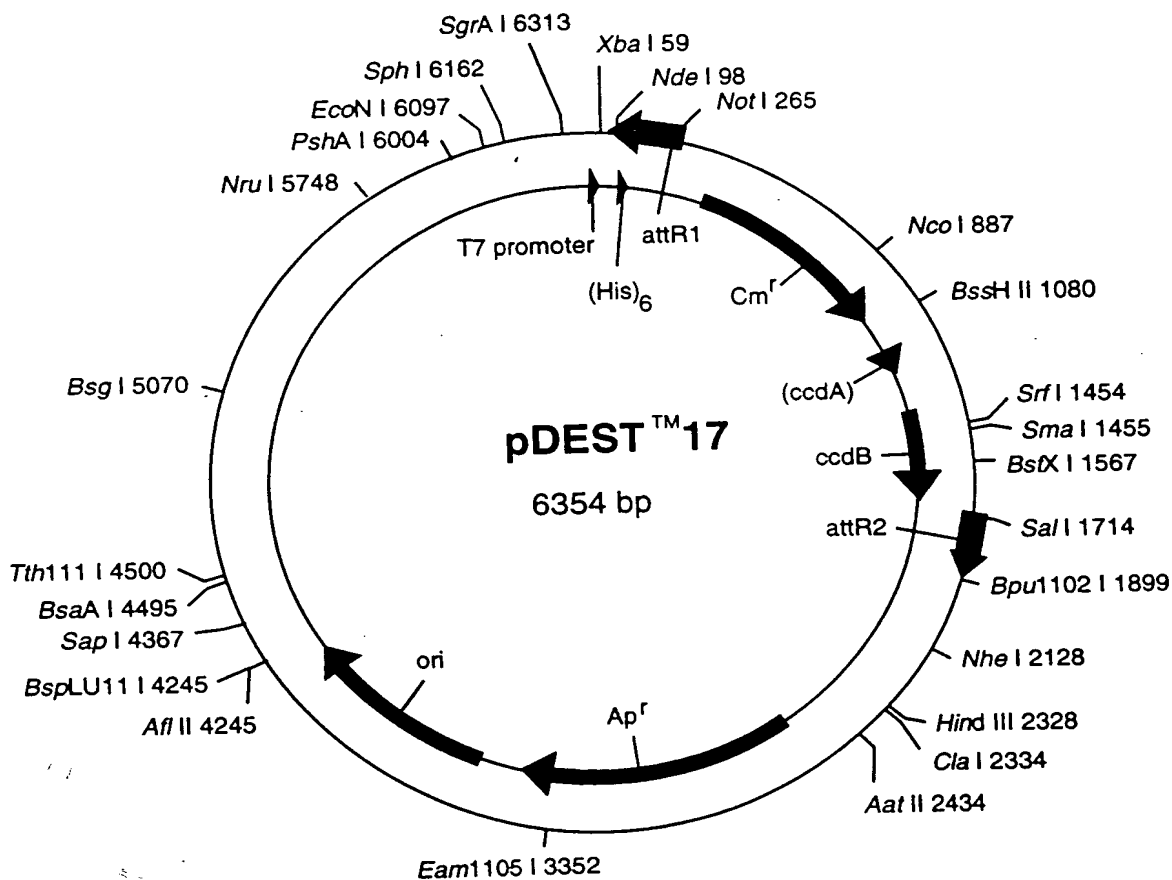
6301 AAAGAAGACA GTCATAAGTG CGGCGACGAT AGTCATGCCC CGCGCCCACC GGAAGGAGCT
6361 GACTGGGTTG AAGGCTCTCA AGGGCATCGG TCGATCGACG CTCTCCCTTA TGCGACTCCT
6421 GCATTAGGAA GCAGCCCAGT AGTAGGTTGA GGCCGTTGAG CACCGCCGCC GCAAGGAATG
6481 GTGCATGCAA GGAGATGGCG CCCAACAGTC CCCCGGCCAC GGGGCCTGCC ACCATACCCA
6541 CGCCGAAACA AGCGCTCATG AGCCCGAAGT GGCGAGCCCG ATCTTCCCCA TCGGTGATGT
6601 CGGCGATATA GGCGCCAGCA ACCGCACCTG TGGCGCCGGT GATGCCGGCC ACGATGCGTC
6661 CGGCGTAGAG GATCG

FIGURE 36D

Figure 37A: pDEST17 His6 Fusion in *E. coli* T7 Promoter

1 gat ccc gcg aaa tta ata cga ctc act ata ggg aga cca caa cgg ttt ccc
 cta ggg cgc ttt aat tat gct gag tga tat ccc tct ggt gtt gcc aaa ggg
 52 tct aga aat aat ttt gtt taa ctt taa gaa gga gat ata cat atg tgg tac
 aga tct tta tta aaa caa att gaa att ctt cct cta tat gta tac agc atg
 103 Y H H H H H L E S T S L Y K K A
 tac cat cac cat cac cat cac ctc gaa tca aca agt tgg tac aaa aaa gct
 atg gta gtg gta gtg gta gtg gag ctt agt tgt tca aac atg ttt ttt cga

T7 Promoter: tta ata cga ctc act ata ggg
 Start Translation: atg tgg tac
 attR1: aca agt tgg tac aaa aaa gct
 Int: tgt tca aac atg ttt ttt cga



pDEST17 6354 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
258..134	attR1
367..1026	CmR
1146..1230	inactivated ccdA
1368..1673	ccdB
1714..1838	attR2
2564..3421	ampR

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1 CGATCCCGCG AAATTAATAC GACTCACTAT AGGGAGACCA CAACGGTTTC CCTCTAGAAA
61 TAATTTTGTT TAACTTTAAG AAGGAGATAT ACATATGTCG TACTACCATC ACCATCACCA
121 TCACCTCGAA TCAACAAAGTT TGTACAAAAA AGCTGAACGA GAAACGTAAA ATGATATAAA
181 TATCAATATA TTAAATTAGA TTTTGCATAA AAAACAGACT ACATAATACT GTAAAACACA
241 ACATATCCAG TCACTATGGC GGCCGCATTA GGCACCCAG GCTTTTACACT TTATGCTTCC
301 GGCTCGTATA ATGTGTGGAT TTTGAGTTAG GATCCGTCGA GATTTTTCAGG AGCTAAGGAA
361 GCTAAAATGG AGAAAAAAT CACTGGATAT ACCACCGTTG ATATATCCCA ATGGCATCGT
421 AAAGAACATT TTGAGGCATT TCAGTCAGTT GCTCAATGTA CCTATAACCA GACCGTTCAG
481 CTGGATATTA CGGCCTTTTT AAAGACCGTA AAGAAAAATA AGCACAAGTT TTATCCGGCC
541 TTTATTACACA TTCTTGCCCC CCTGATGAAT GCTCATCCGG AATTCCGTAT GGCAATGAAA
601 GACGGTGAGC TGGTGATATG GGATAGTGTT CACCCTTGTT ACACCGTTTT CCATGAGCAA
661 ACTGAAACGT TTTCATCGCT CTGGAGTGAA TACCACGACG ATTTCCGGCA GTTTCTACAC
721 ATATATTTCG AAGATGTGGC GTGTTACGGT GAAAACCTGG CCTATTTCCC TAAAGGGTTT
781 ATTGAGAATA TGTTTTTCGT CTCAGCCAAT CCCTGGGTGA GTTTCACCAG TTTTGATTTA
841 AACGTGGCCA ATATGGACAA CTTCTTCGCC CCCGTTTTCA CCATGGGCAA ATATTATACG
901 CAAGGCGACA AGGTGCTGAT GCCGCTGGCG ATTCAGGTTT ATCATGCCGT CTGTGATGGC
961 TTCCATGTCG GCAGAATGCT TAATGAATTA CAACAGTACT GCGATGAGTG GCAGGCGGG
1021 GCGTAAAGAT CTGGATCCGG CTTACTAAAA GCCAGATAAC AGTATGCGTA TTTGCGCGCT
1081 GATTTTTGCG GTATAAGAAT ATATACTGAT ATGTATACCC GAAGTATGTC AAAAAGAGGT
1141 GTGCTATGAA GCAGCGTATT ACAGTGACAG TTGACAGCGA CAGCTATCAG TTGCTCAAGG
1201 CATATATGAT GTCAATATCT CCGGTCTGGT AAGCACAACC ATGCAGATG AAGCCCGTCG
1261 TCTGCGTGCC GAACGCTGGA AAGCGGAAAA TCAGGAAGGG ATGGCTGAGG TCGCCCGGTT
1321 TATTGAAATG AACGGCTCTT TTGCTGACGA GAACAGGGAC TGGTGAAATG CAGTTTAAGG
1381 TTTACACCTA TAAAAGAGAG AGCCGTTATC GTCTGTTTGT GGATGTACAG AGTGATATTA
1441 TTGACACGCC CGGGCGACGG ATGGTGATCC CCCTGGCCAG TGCACGCTCTG CTGTCAGATA
1501 AAGTCTCCCG TGAACTTTAC CCGGTGGTGC ATATCGGGGA AGAAGTGGCT GATCTCAGCC
1561 CCACCGATAT GGCCAGTGTG CCGGTCTCCG TTATCGGGGA AGAAGTGGCT GATCTCAGCC
1621 ACCGCGAAAA TGACATCAAA AACGCCATTA ACCTGATGTT CTGGGGAATA TAAATGTCAG
1681 GCTCCCTTAT ACACAGCCAG TCTGCAGGTC GACCATAGTG ACTGGATATG TTGTGTTTTA
1741 CAGTATTATG TAGTCTGTTT TTTATGCAAA ATCTAATTTA ATATATTGAT ATTTATATCA
1801 TTTTACGTTT CTCGTTTCAGC TTTCTTGTA AAAGTGGTTG ATTCGAGGCT GCTAACAAAG
1861 CCCGAAAGGA AGCTGAGTTG GCTGCTGCCA CCGCTGAGCA ATAAGTAGCA TAACCCCTTG
1921 GGGCCTCTAA ACGGGTCTTG AGGGGTTTTT TGCTGAAAGG AGGAAGTATA TCCGGATATC
1981 CACAGGACGG GTGTGGTCGC CATGATCGCG TAGTCGATAG TGGCTCCAAG TAGCGAAGCG
2041 AGCAGGACTG GCGGCGCGCC AAAGCGGTCG GACAGTGCTC CGAGAACGGG TGCGCATAGA
2101 AATTGCATCA ACGCATATAG CGCTAGCAGC ACGCCATAGT GACTGGCGAT GCTGTGCGAA
2161 TGGACGATAT CCCGCAAGAG GCGCGGCAGT ACCGGCATAA CCAAGCCTAT GCCTACAGCA
2221 TCCAGGGTGA CGGTGCCGAG GATGACGATG AGCGCATTGT TAGATTTTAT ACACGGTGCC
2281 TGACTGCGTT AGCAATTTAA CTGTGATAAA CTACCGCATT AAAGCCTATC GATGATAAGC
2341 TGTCAAACAT GAGAATTCTT GAAGACGAAA GGGCCTCGTG ATACGCCTAT TTTTATAGGT
2401 TAATGTCATG ATAATAATGG TTTCTTAGAC GTCAGGTGGC ACTTTTCGGG GAAATGTGCG
2461 CGGAACCCCT ATTTGTTTTT TTTTCTAAT ACATTCAAAT ATGTATCCGC TCATGAGACA
2521 ATAACCCTGA TAAATGCTTC AATAATATTG AAAAAGGAAG AGTATGAGTA TTCAACATTT
2581 CCGTGTCGCC CTTATTCCCT TTTTTCGCGC ATTTTGCTT CCTGTTTTTG CTCACCCAGA
2641 AACGCTGGTG AAAGTAAAAG ATGCTGAAGA TCAGTTGGGT GCACGAGTGG GTTACATCGA-

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Figure 37B

2701	ACTGGATCTC	AACAGCGGTA	AGATCCTTGA	GAGTTTTTCGC	CCCGAAGAAC	GTTTTCCAAT
2761	GATGAGCACT	TTTAAAGTTC	TGCTATGTGG	CGCGGTATTA	TCCCGTGTG	ACGCCGGGCA
2821	AGAGCAACTC	GGTCGCCGCA	TACACTATTC	TCAGAATGAC	TTGGTTGAGT	ACTCACCAGT
2881	CACAGAAAAG	CATCTTACGG	ATGGCATGAC	AGTAAGAGAA	TTATGCAGTG	CTGCCATAAC
2941	CATGAGTGAT	AACACTGCGG	CCAACCTACT	TCTGACAACG	ATCGGAGGAC	CGAAGGAGCT
3001	AACCGCTTTT	TTGCACAACA	TGGGGGATCA	TGTAACCTCGC	CTTGATCGTT	GGGAACCGGA
3061	GCTGAATGAA	GCCATACCAA	ACGACGAGCG	TGACACCACG	ATGCCTGCAG	CAATGGCAAC
3121	AACGTTGCGC	AAACTATTAA	CTGGCGAACT	ACTTACTCTA	GCTTCCCGGC	AACAATTAAT
3181	AGACTGGATG	GAGGCGGATA	AAGTTGCAGG	ACCACTTCTG	CGCTCGGCCC	TTCCGGCTGG
3241	CTGGTTTATT	GCTGATAAAT	CTGGAGCCGG	TGAGCGTGGG	TCTCGCGGTA	TCATTGCAGC
3301	ACTGGGGCCA	GATGGTAAGC	CCTCCCGTAT	CGTAGTTATC	TACACGACGG	GGAGTCAGGC
3361	AACTATGGAT	GAACGAAATA	GACAGATCGC	TGAGATAGGT	GCCTCACTGA	TTAAGCATTG
3421	GTAAGTGTC	GACCAAGTTT	ACTCATATAT	ACTTTAGATT	GATTTAAAAC	TTCATTTTTTA
3481	ATTTAAAAGG	ATCTAGGTGA	AGATCCTTTT	TGATAATCTC	ATGACCAAAA	TCCCTTAACG
3541	TGAGTTTTTCG	TTCCACTGAG	CGTCAGACCC	CGTAGAAAAG	ATCAAAGGAT	CTTCTTGAGA
3601	TCCTTTTTTTT	CTGCGCGTAA	TCTGCTGCTT	GCAAACAAAA	AAACCACCGC	TACCAGCGGT
3661	GGTTTGTGTTG	CCGGATCAAG	AGCTACCAAC	TCTTTTTTCCG	AAGGTAAC TG	GCTTCAGCAG
3721	AGCGCAGATA	CCAAATACTG	TCCTTCTAGT	GTAGCCGTAG	TTAGGCCACC	ACTTCAAGAA
3781	CTCTGTAGCA	CCGCCTACAT	ACCTCGCTCT	GCTAATCCTG	TTACCAGTGG	CTGCTGCCAG
3841	TGGCGATAAG	TCGTGTCTTA	CCGGGTGGA	CTCAAGACGA	TAGTTACCGG	ATAAGGCGCA
3901	GCGGTCGGGC	TGAACGGGGG	GTTCTGTGAC	ACAGCCCAGC	TTGGAGCGAA	CGACCTACAC
3961	CGAAGTGAGA	TACCTACAGC	GTGAGCTATG	AGAAAGCGCC	ACGCTTCCCG	AAGGGAGAAA
4021	GGCGGACAGG	TATCCGGTAA	GCGGCAGGTT	CGGAACAGGA	GAGCGCACGA	GGGAGCTTCC
4081	AGGGGGAAAC	GCCTGGTATC	TTTATAGTCC	TGTCGGGTTT	CGCCACCTCT	GACTTGAGCG
4141	TCGATTTTTTG	TGATGCTCGT	CAGGGGGGCG	GAGCCTATGG	AAAAACGCCA	GCAACGCGGC
4201	CTTTTTTACGG	TTCTTGCCCT	TTTGCTGGCC	TTTTGCTCAC	ATGTTCTTTC	CTGCGTTATC
4261	CCCTGATTCT	GTGGATAACC	GTATTACCGC	CTTTGAGTGA	GCTGATACCG	CTCGCCGCAG
4321	CCGAACGACC	GAGCGCAGCG	AGTCAGTGAG	CGAGGAAGCG	GAAGAGCGCC	TGATGCGGTA
4381	TTTTCTCCTT	ACGCATCTGT	GCGGTATTTT	ACACCGCATA	TATGGTGCAC	TCTCAGTACA
4441	ATCTGCTCTG	ATGCCGCATA	GTTAAGCCAG	TATACACTCC	GCTATCGCTA	CGTGACTGGG
4501	TCATGGCTGC	GCCCCGACAC	CCGCCAACAC	CCGCTGACGC	GCCCTGACGG	GCTTGTCTGC
4561	TCCCGGCATC	CGCTTACAGA	CAAGCTGTGA	CCGTCTCCGG	GAGCTGCATG	TGTCAGAGGT
4621	TTTCACCGTC	ATCACCGAAA	CGCGCGAGGC	AGCTGCGGTA	AAGCTCATCA	GCGTGGTCTG
4681	GAAGCGATTG	ACAGATGTCT	GCCTGTTTCT	CCGCGTCCAG	CTCGTTGAGT	TTCTCCAGAA
4741	GCGTTAATGT	CTGGCTTCTG	ATAAAGCGGG	CCATGTTAAG	GGCGGTTTTT	TCCTGTTTGG
4801	TCAGTGATGC	CTCCGTGTAA	GGGGGATTTT	TGTTTATGGG	GGTAATGATA	CCGATGAAAC
4861	GAGAGAGGAT	GCTCACGATA	CGGGTTACTG	ATGATGAACA	TGCCCCGTTA	CTGGAACGTT
4921	GTGAGGGTAA	ACAACCTGGC	GTATGGATGC	GGCGGGACCA	GAGAAAAATC	ACTCAGGGTT
4981	AATGCCAGCG	CTTCGTTAAT	ACAGATGTAG	GTGTTCCACA	GGGTAGCCAG	CAGCATCCTG
5041	CGATGCGAGT	CCGGAACATA	ATGGTGCAGG	GCGCTGACTT	CCGCGTTTCC	AGACTTTACG
5101	AAACACGGAA	ACCGAAGACC	ATTTCATGTT	TTGCTCAGGT	CGCAGACGTT	TTGCAGCAGC
5161	AGTCGCTTCA	CGTTCGCTCG	CGTATCGGTG	ATTTCATTCT	CTAACCGATA	AGGCAACCCC
5221	GCCAGCCTAG	CCGGGTCCTC	AACGACAGGA	GCACGATCAT	GCGCACCCGT	GGCCAGGACC
5281	CAACGCTGCC	CGAGATGCGC	CGCGTGCGGC	TGCTGGAGAT	GGCGGACGCG	ATGGATATGT
5341	TCTGCCAAGG	GTTGGTTTGC	GCATTACACG	TTCTCCGCAA	GAATTGATTG	GCTCCAATTC
5401	TTGGAGTGGT	GAATCCGTTA	GCGAGGTGCC	GCCGGCTTCC	ATTTCAGGTC	AGGTGGCCCC
5461	GCTCCATGCA	CCGCGACGCA	ACGCGGGGAG	GCAGACAAGG	TATAGGGCGG	CGCCTACAAT
5521	CCATGCCAAC	CCGTTCCATG	TGCTCGCCGA	GGCGGCATAA	ATCGCCGTGA	CGATCAGCGG
5581	TCCAGTGATC	GAAGTTAGGC	TGGTAAGAGC	CGCGAGCGAT	CCTTGAAGCT	GTCCCTGATG
5641	GTCGTCATCT	ACCTGCCTGG	ACAGCATGGC	CTGCAACGCG	GGCATCCCGA	TGCCGCCGGA
5701	AGCGAGAAGA	ATCATAATGG	GGAAGGCCAT	CCAGCCTCGC	GTCGCGAACG	CCAGCAAGAC
5761	GTAGCCCAGC	GCGTCGGCCG	CCATGCCGGC	GATAATGGCC	TGCTTCTCGC	CGAAACGTTT
5821	GGTGGCGGGA	CCAGTGACGA	AGGCTTTGAG	GAGGGCGTGC	AAGATTCCGA	ATACCCAGAG
5881	CGACAGGCCG	ATCATCGTCG	GCTCCAGCG	AAAGCGGTCC	TCGCCGAAAA	GTACCGAGAG
5941	CGCTGCCGGC	ACCTGTCCTA	CGAGTTGCAT	GATAAAGAAG	ACAGTCATAA	TGCGGGCGAC
6001	GATAGTCATG	CCCCGCGCCC	ACCGGAAGGA	GCTGACTGGG	TTGAAGGCTC	TCAAGGGCAT
6061	CGGTCGATCG	ACGCTCTCCC	TTATGCGACT	CCTGCATTAG	GAAGCAGCCC	AGTAGTAGGT
6121	TGAGGCCGTT	GAGCACCGCC	GCCGCAAGGA	ATGGTGCATG	CAAGGAGATG	GCGCCCAACA-

Figure 37C

6181 GTCCCCCGGC CACGGGGCCT GCCACCATAC CCACGCCGAA ACAAGCGCTC ATGAGCCCGA
6241 AGTGGCGAGC CCGATCTTCC CCATCGGTGA TGTCGGCGAT ATAGGCGCCA GCAACCGCAC
6301 CTGTGGCGCC GGTGATGCCG GCCACGATGC GTCCGGCGTA GAGGATCGAG ATCT

[illegible]

Figure 38A: pDEST18

FastBac Transfer Vector with p10 Baculovirus Promoter

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1  gaagacctcg gccgtcgccg cgcttgccgg tgggtgctgac cccggatgaa gtggttcgca
   cttctggagc cggcagcgcc gcgaacggcc accacgactg gggcctactt caccaagcgt

61  tcttcggttt tctggaaggc gagcatcggt tgttcgccc ggaactctagc tatagtctta
   aggagccaaa agaccttcgc ctcgtagcaa acaagcgggt cctgagatcg atatcaagat

121  gtggttggtt acgtatcgag caagaaata aaacggcaa tgcgtggag tcttctgtgc
   caccaaccga tgcatagctc gttcttttat ttgcggtt gcgaacctc agaacaacg

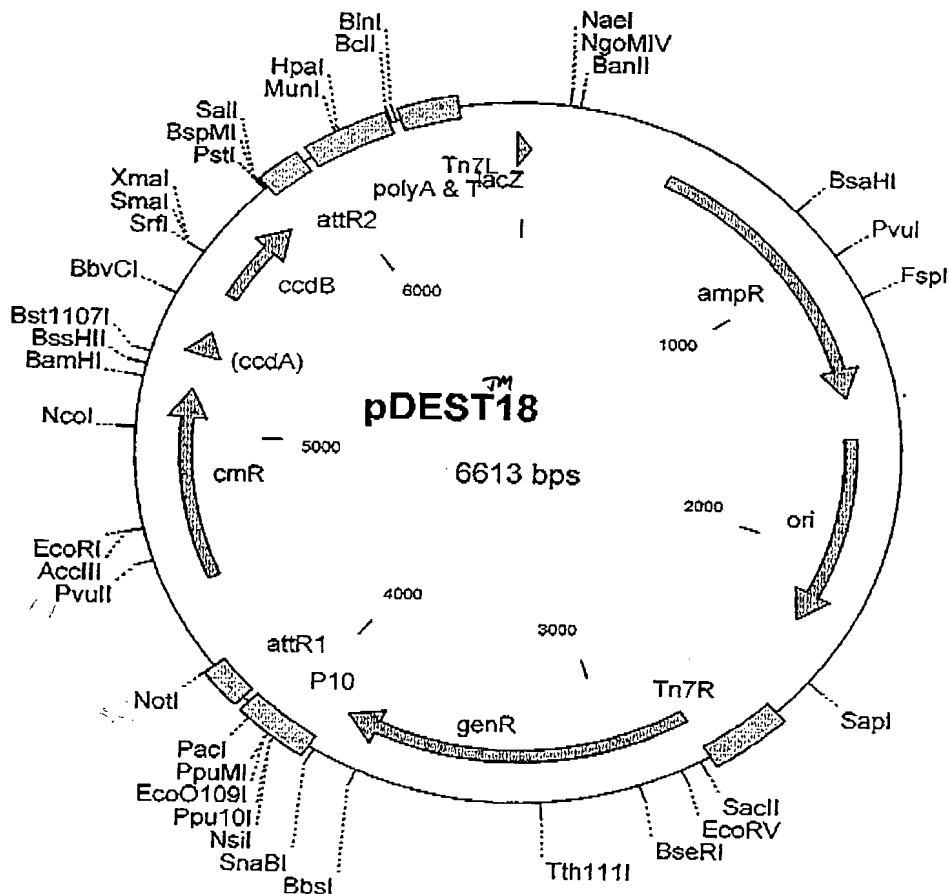
181  //tatgtttaca aagatccaga aatacggcacc attacaaca aggggggacta tgaattatg//
   //ataaaaatgt ttctaagctc ttatgcgtag tgaatgttgt tccccctgat acittaatat//

241  //cattttgagg atgcccggac ctttaattca acccaacaca atatattata gttaaataag// mRNA
   //gtaaaactcc tacggccctg gaaattaagt tgggtgtgtg tatataatat caatttatc//

301  //atttatatat caaatcattt gtataatta taaaatacta tactgtfaat tacattttat
   //taataaata gtttagtaaa oataataatta attttatgat atgacattta atgtaaaata

361  ttacaatgag gatcatcaca agttttgaca aaaaagctga acgagaaacg taaaatgata
   aatgttactc ctagtagtgt tcaaacatgt ttttcgact tgctctttgc attttactat//

```



pDEST18 6613 bp

Location (Base Nos.)	Gene Encoded
474..1449	ampR
1590..2244	ori
2738..3850	genR
4251..4127	attR1
4501..5160	CmR
5280..5364	inactivated ccdA
5502..5807	ccdB
5848..5972	attR2
6595..25	lacZ

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1  GACGCGCCCT GTAGCGGCGC ATTAAGCGCG GCGGGTGTGG TGGTTACGCG CAGCGTGACC
61 GCTACACTTG CCAGCGCCCT AGCGCCCGCT CCTTTCGCTT TCTTCCCTTC CTTTCTCGCC
121 ACGTTCGCCG GCTTTCCTCCG TCAAGCTCTA AATCGGGGGC TCCCTTTAGG GTTCCGATTT
181 AGTGCTTTAC GGCACCTCGA CCCCCAAAAA CTTGATTAGG GTGATGGTTC ACGTAGTGGG
241 CCATCGCCCT GATAGACGGT TTTTCGCCCT TTGACGTTGG AGTCCACGTT CTTTAATAGT
301 GGA CTCTTGT TCCAAACTGG AACAACTC AACCCATCT CGGTCTATTC TTTTGATTTA
361 TAAGGGATTT TGCCGATTTC GGCCTATTGG TTAAAAAATG AGCTGATTTA AAAAAAATTT
421 AACGCGAATT TTAACAAAAT ATTAACGTTT ACAATTTTCA GTGGCACTTT TCGGGGAAAT
481 GTGCGCGGAA CCCCTATTTG TTTATTTTTC TAAATACATT CAAATATGTA TCCGCTCATG
541 AGACAATAAC CCTGATAAAT GCTTCAATAA TATTGAAAAA GGAAGAGTAT GAGTATTCAA
601 CATTTCCGTG TCGCCCTTAT TCCCTTTTTT GCGGCATTTT GCCTTCCTGT TTTTGCTCAC
661 CCAGAAACGC TGGTGAAAGT AAAAGATGCT GAAGATCAGT TGGGTGCACG AGTGGGTTCAC
721 ATCGAACTGG ATCTCAACAG CGGTAAGATC CTTGAGAGTT TTCGCCCCGA AGAACGTTTT
781 CCAATGATGA GCACTTTTAA AGTTCGTGTA TGTGGCGCGG TATTATCCCG TATTGACGCC
841 GGGCAAGAGC AACTCGGTCG CCGCATACAC TATTCTCAGA ATGACTTGGT TGAGTACTCA
901 CCAGTCACAG AAAAGCATCT TACGGATGGC ATGACAGTAA GAGAATTATG CAGTGCTGCC
961 ATAACCATGA GTGATAACAC TGCGGCCAAC TTACTTCTGA CAACGATCGG AGGACCGAAG
1021 GAGCTAACCG CTTTTTTGCA CAACATGGGG GATCATGTAA CTCGCCCTGA TCGTTGGGAA
1081 CCGGAGCTGA ATGAAGCCAT ACCAAACGAC GAGCGTGACA CCACGATGCC TGTAGCAATG
1141 GCAACAACGT TGCGCAAAC TTAACCTGGC GAACACTTCTA CTCTAGCTTC CCGGCAACAA
1201 TTAATAGACT GGATGGAGGC GGATAAAGTT GCAGGACCAC TTCTGCGCTC GGCCCTTCCG
1261 GCTGGCTGGT TTATTGCTGA TAAATCTGGA GCCGGTGAGC GTGGGTCTCG CGGTATCATT
1321 GCAGCACTGG GGCCAGATGG TAAGCCCTCC CGTATCGTAG TTATCTACAC GACGGGGAGT
1381 CAGGCAACTA TGGATGAACG AAATAGACAG ATCGCTGAGA TAGGTGCCTC ACTGATTAAG
1441 CATTGGTAAC TGTCAGACCA AGTTTACTCA TATATACTTT AGATTGATTT AAAACTTCAT
1501 TTTTAATTTA AAAGGATCTA GGTGAAGATC CTTTTTTGATA ATCTCATGAC CAAAATCCCT
1561 TAACGTGAGT TTTCGTTCCA CTGAGCGTCA GACCCCGTAG AAAAGATCAA AGGATCTTCT
1621 TGAGATCCTT TTTTCTGCG CGTAATCTGC TGCTTGCAAA CAAAAAACC ACCGCTACCA
1681 GCGGTGGTTT GTTTGCCGGA TCAAGAGCTA CCAACTCTTT TTCCGAAGGT AACTGGCTTC
1741 AGCAGAGCGC AGATACCAA TACTGTCTTT CTAGTGTAGC CGTAGTTAGG CCACCACTTC
1801 AAGAACTCTG TAGCACCACC TACATACCTC GCTCTGCTAA TCCTGTTACC AGTGGCTGCT
1861 GCCAGTGGCG ATAAGTCGTG TCTTACCGGG TTGGACTCAA GACGATAGTT ACCGATAAG
1921 GCGCAGCGGT CGGGCTGAAC GGGGGGTTCG TGCACACAGC CCAGCTTGGG GCGAACGACC
1981 TACACCGAAC TGAGATACCT ACAGCGTGAG CATTGAGAAA GCGCCACGCT TCCCGAAGGG
2041 AGAAAGGCGG ACAGGTATCC GGTAAGCGGC AGGGTCGGAA CAGGAGAGCG CACGAGGGAG
2101 CTTCCAGGGG GAAACGCCTG GTATCTTTAT AGTCCTGTCG GGTTCGCCA CCTCTGACTT
2161 GAGCGTCGAT TTTTGTGATG CTCGTCAGGG GGGCGGAGCC TATGGAAAAA CGCCAGCAAC
2221 GCGGCCTTTT TACGGTTCCT GGCCTTTTTC TGGCCTTTTG CTCACATGTT CTTTCCCTCG
2281 TTATCCCTTG ATTCTGTGGA TAACCGTATT ACCGCCTTTG AGTGAGCTGA TATTCCTCGC
2341 CGCAGCCGAA CGACCGAGCG CAGCGAGTCA GTGAGCGAGG AAGCGGAAGA GCGCCTGATG
2401 CCGTATTTTC TCCTTACGCA TCTGTGCGGT ATTTACACACC GCAGACCAGC CGCGTAACCT
2461 GGCAAAATCG GTTACGGTTG AGTAATAAAT GGATGCCCTG CGTAAGCGGG TGTGGGCGGA-

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Figure 38B

2521 CAATAAAGTC TTAAACTGAA CAAAATAGAT CTAAACTATG ACAATAAAGT CTTAAACTAG
2581 ACAGAATAGT TGTAAGTGA AATCAGTCCA GTTATGCTGT GAAAAAGCAT ACTGGACTTT
2641 TGTTATGGCT AAAGCAAACCT CTTCAATTTT TGAAGTGCAA ATTGCCCCGTC GTATTAAAGA
2701 GGGGCGTGGC CAAGGGCATG GTAAAGACTA TATTCGCGGC GTTGTGACAA TTTACCGAAC
2761 AACTCCGCGG CCGGGAAGCC GATCTCGGCT TGAACGAATT GTTAGGTGGC GGTACTTGGG
2821 TCGATATCAA AGTGCATCAC TTCTTCCCGT ATGCCCCAAT TTGTATAGAG AGCCACTGCG
2881 GGATCGTCAC CGTAATCTGC TTGCACGTAG ATCACATAAG CACCAAGCGC GTTGGCCCTCA
2941 TGCTTGAGGA GATTGATGAG CGCGGTGGCA ATGCCCTGCC TCCGGTGCTC GCCGGAGACT
3001 GCGAGATCAT AGATATAGAT CTCACTACGC GGCTGCTCAA ACCTGGGCAG AACGTAAGCC
3061 GCGAGAGCGC CAACAACCGC TTCTTGSTCG AAGGCAGCAA GCGCGATGAA TGTCTTACTA
3121 CGGAGCAAGT TCCCGAGGTA ATCGGAGTCC GGCTGATGTT GGGAGTAGGT GGCTACGTCT
3181 CCGAACTCAC GACCGAAAAG ATCAAGAGCA GCCTCGCATGG ATTTGACTTG GTCAGGGCCG
3241 AGCCTACATG TGCGAATGAT GCCCATACTT GAGCCACCTA ACTTTGTTTT AGGGCGACTG
3301 CCCTGCTGCG TAACATCGTT GCTGCTGCGT AACATCGTTG CTGCTCCATA ACATCAAACA
3361 TCGACCCACG GCGTAACGCG CTTGCTGCTT GGATGCCCCG GGCATAGACT GTACAAAAAA
3421 ACAGTCATAA CAAGCCATGA AAACCGCCAC TCGCCCGTTA CCACCGCTGC GTTCGGTCAA
3481 GGTTCTGGAC CAGTTGCGTG AGCGCATACG CTACTTGCAT TACAGTTTAC GAACCGAACA
3541 GGCTTATGTC AACTGGGTTC GTGCCCTCAT CCGTTTCCAC GGTGTGCGTC ACCCGGCAAC
3601 CTTGGGCAGC AGCGAAGTCG AGGCATTTCT GTCCTGGCTG GCGAACGAGC GCAAGGTTTC
3661 GGTCTCCACG CATCGTCAGG CATTTGGCGG CTTGCTGTTT TTCTACGGCA AGGTGCTGTG
3721 CACGGATCTG CCCTGGCTTC AGGAGATCGG AAGACCTCGG CCGTCGCGGC GCTTGCCGGT
3781 GGTGCTGACC CCGGATGAAG TGGTTCGCAT CCTCGGTTTT CTGGAAGGCG AGCATCGTTT
3841 GTTCGCCCAG GACTCTAGCT ATAGTTCTAG TGGTTGGCTA CGTATCGAGC AAGAAAAATA
3901 AACGCCAAAC GCGTTGGAGT CTTGTGTGCT ATTTTACAA AGATTGAGAA ATACGCATCA
3961 CTTACAACAA GGGGACTAT GAAATTATGC ATTTTGAGGA TGCCGGGACC TTTAATTCAA
4021 CCCAACACAA TATATTATAG TTAAATAAGA ATTATTTATC AAATCATTTG TATATTAATT
4081 AAAATACTAT ACTGTAAATT ACATTTTATT TACAATGAGG ATCATCACAA GTTTGTACAA
4141 AAAAGCTGAA CGAGAAACGT AAAATGATAT AAATATCAAT ATATTAAATT AGATTTTGCA
4201 TAAAAAACAG ACTACATAAT ACTGTAAAAC ACAACATATC CAGTCACTAT GCGCGCCGCT
4261 AAGTTGGCAG CATCACCCGA CGCACTTTGC GCCGAATAAA TACCTGTGAC GGAAGATCAC
4321 TTCGAGAAAT AAATAAATCC TGGTGTCCCT GTTGATACCG GGAAGCCCTG GGCCAACTTT
4381 TGGCGAAAAT GAGACGTTGA TCGGCACGTA AGAGGTTCCA ACTTTCACCA TAATGAAATA
4441 AGATCACTAC CGGGCGTATT TTTTGAGTTA TCGAGATTTT CAGGAGCTAA GGAAGCTAAA
4501 ATGGAGAAAA AAATCACTGG ATATACCACC GTTGATATAT CCCAATGGCA TCGTAAAGAA
4561 CATTTTGAGG CATTTTCAGT AGTTGCTCAA TGTACCTATA ACCAGACCGT TCAGCTGGAT
4621 ATTACGGCCT TTTTAAAGAC CGTAAAGAAA AATAAGCACA AGTTTATACC GGCCTTTATT
4681 CACATTCTTG CCCGCCGTAT GAATGCTCAT CCGGAATTCC GTATGGCAAT GAAAGACGGT
4741 GAGCTGGTGA TATGGGATAG GTTTCACCTT TGTACACCG TTTCCATGA GCAAAGTCAA
4801 ACGTTTTTAT CGTCTGGAG TGAATACCAC GACGATTTCC GGCAGTTTCT ACACATATAT
4861 TCGCAAGATG TGGCGTGTTA CCGGTGAAAAC CTGGCCTATT TCCCTAAAGG GTTTATTGAG
4921 AATATGTTTT TCGTCTCAGC CAATCCCTGG GTGAGTTTCA CCAGTTTGA TTTAAACGTG
4981 GCCAATATGG ACAACTTCTT CGCCCCCGTT TTCACCATGG GCAAATATTA TACGCAAGGC
5041 GACAAGGTGC TGATGCCGCT GGCAGTTTCA GTTCATCATG CCGTCTGTGA TGGCTTCCAT
5101 GTCGGCAGAA TGCTTAATGA ATTACAACAG TACTGCGATG AGTGGCAGGG CGGGGCGTAA
5161 ACGCGTGGAT CCGGCTTACT AAAAGCCAGA TAACAGTATG CGTATTTGCG CGCTGATTTT
5221 TGCGGTATAA GAATATATAC TGATATGTAT ACCCGAAGTA TGTCAAAAAG AGGTGTGCTA
5281 TGAAGCAGCG TATTACAGTG ACAGTTGACA GCGACAGCTA TCAGTTGCTC AAGGCATATA
5341 TGATGTCAAT ATCTCCGGTC TGGTAAGCAC AACCATGCAG AATGAAGCCC GTCGTCTGCG
5401 TGCCGAACGC TGGAAGCGG AAAATCAGGA AGGGATGGCT GAGGTCGCCC GGTATTATTGA
5461 AATGAACGGC TCTTTTGCTG ACGAGAACAG GGACTGGTGA AATGCAGTTT AAGGTTTACA
5521 CCTATAAAAG AGAGAGCCGT TATCGTCTGT TTGTGGATGT ACAGAGTGAT ATTATTGACA
5581 CGCCCGGGCG ACGGATGGTG ATCCCCCTGG CAGTGCACG TCTGCTGTCA GATAAAGTCT
5641 CCCGTGAAC TTAACCGGTG GTGCATATCG GGGATGAAAG CTGGCGCATG ATGACCACCG
5701 ATATGGCCAG TGTGCCGGTC TCCGTTATCG GGGGAAGAAG GGCTGATCTC AGCCACCGCG
5761 AAAATGACAT CAAAAACGCC ATTAACCTGA TGTTCTGGGG AATATAAATG TCAGGCTCCC
5821 TTATACACAG CCAGTCTGCA GGTGACCAT AGTGACTGGA TATGTTGTGT TTTACAGTAT
5881 TATGTAGTCT GTTTTTTATG CAAAATCTAA TTTAATATAT TGATATTTAT ATCATTTTAC
5941 GTTTCTCGTT CAGCTTTCTT GTACAAAGTG GTGATAGCTT GTCGAGAAGT ACTAGAGGAT-

FIGURE 38C

6001	CATAATCAGC	CATACCACAT	TTGTAGAGGT	TTTACTTGCT	TTAAAAAACC	TCCCACACCT
6061	CCCCCTGAAC	CTGAAACATA	AAATGAATGC	AATTGTTGTT	GTAACTTGT	TTATTGCAGC
6121	TTATAATGGT	TACAAATAAA	GCAATAGCAT	CACAAATTC	ACAAATAAAG	CATTTTTTTC
6181	ACTGCATTCT	AGTTGTGGTT	TGTCCAAACT	CATCAATGTA	TCTTATCATG	TCTGGATCTG
6241	ATCACTGCTT	GAGCCTAGGA	GATCCGAACC	AGATAAGTGA	AATCTAGTTC	CAAACATATT
6301	TGTCATTTTT	AATTTTCGTA	TTAGCTTACG	ACGCTACACC	CAGTTCCCAT	CTATTTTGTC
6361	ACTCTTCCCT	AAATAATCCT	TAAAAACTCC	ATTTCCACCC	CTCCCAGTTC	CCAACTATTT
6421	TGTCCGCCCA	CAGCGGGGCA	TTTTTCTTCC	TGTTATGTTT	TTAATCAAAC	ATCCTGCCAA
6481	CTCCATGTGA	CAAACCGTCA	TCTTCGGCTA	CTTTTTCTCT	GTCACAGAAT	GAAAATTTTT
6541	CTGTCATCTC	TTCGTTATTA	ATGTTTGTA	TTGACTGAAT	ATCAACGCTT	ATTTGCAGCC
6601	TGAATGGCGA	ATG				

002000 00000000

FIGURE 38D

Figure 39A:

pDEST19

FastBac Transfer Vector with 39K Baculovirus Promoter

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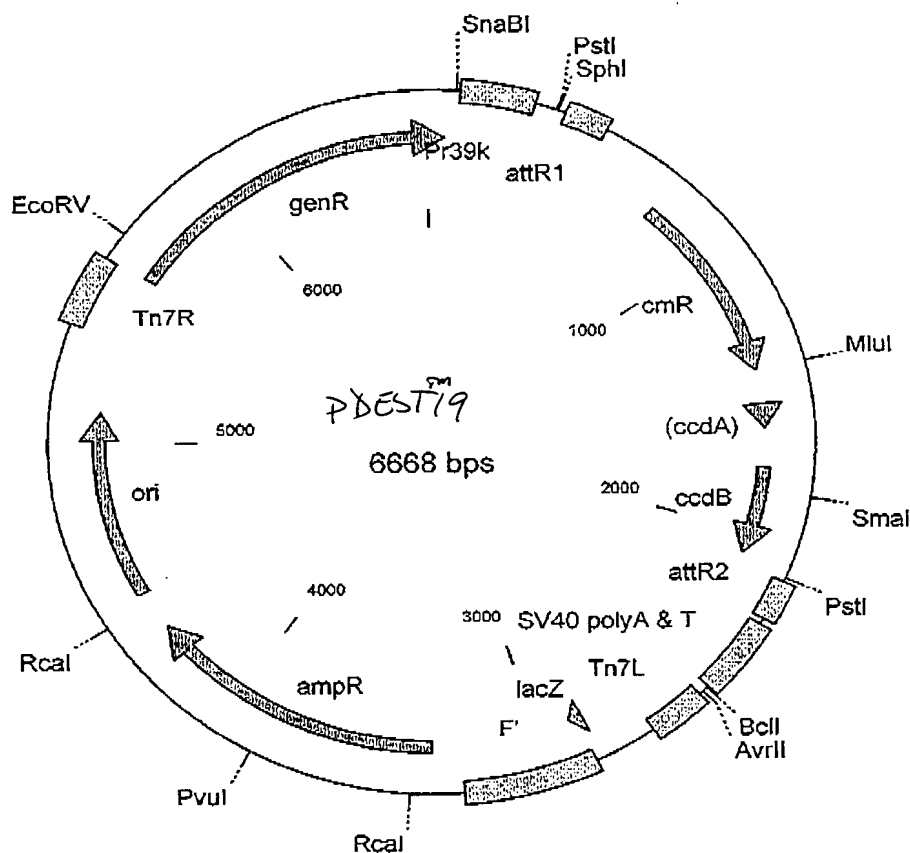
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   ccactgcggc agtagaaaagg taacattgca ttaccggtg aacatctact tgcgcgacag

61  aaaaaaccgg ccagttttctt ccacaaactc ggcacggcgt gtctcgtaaa cttttgcgtc
   ttttttggcc ggtcaaagaa ggtgtttgag cgcgtgccga cagagcattt gaaaacgcag

121 // gcaacaatcg cgatgacctc gtggtatgga aattttttct aaaaaagtgt cgttcatgtc //
    // cgttgttagc gctactggag caccatacct ttaaaaaaga ttttttcaca gcaagtacag //

181 // ggcggcggcg ttgcgcgtcc ggtacgcgcg acgggcacac agcaggacag ccttgctcgg
    // ccgccgcgcg aagcgcgagg ccatgcgcgc tgcccggtg tcgtccgtgc ggaacaggcc

241 ctcgattatc ataaacaatc ctgcaggcat gcaagctgga tcatacaag ttgtacaaa
    gagctaatag tatttgtag gacgtccgta cgttcgacct agtagtgttc aaacatgttt
                                     attR1
                                     Int V
  
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002050-0047560

pDEST19 6668 bp (rotated to position 1000)

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
515..391	attR1
765..1424	CmR
1544..1628	inactivated ccdA
1766..2071	ccdB
2112..2236	attR2
2852..2895	lacZ
3344..4319	ampR
4460..5114	ori
5608..52	genR

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1 AGTGGTTCGC ATCCTCGGTT TTCTGGAAGG CGAGCATCGT TTGTTTCGCCC AGGACTCTAG
61 CTATAGTTCT AGTGGTTGGC TACGTATATC AAATACTTGT AGGTGACGCC GTCATCTTTC
121 CATTGTAACG TAAATGGCAA CTTGTAGATG AACGCGCTGT CAAAAAACCG GCCAGTTTCT
181 TCCACAAACT CGCGCACGGC TGTCTCGTAA ACTTTTTCGT CGCAACAATC GCGATGACCT
241 CGTGGTATGG AAATTTTTTTC TAAAAAAGTG TCGTTCATGT CGGCGGCGGG CGCGTTCGCG
301 CTCCGGTACG CGCGACGGGC ACACAGCAGG ACAGCCTTGT CCGGCTCGAT TATCATAAAC
361 AATCCTGCAG GCATGCAAGC TCGGATCATC ACAAGTTTGT ACAAAAAAGC TGAACGAGAA
421 ACGTAAAATG ATATAAATAT CAATATATTA AATTAGATTT TGCATAAAAA ACAGACTACA
481 TAATACTGTA AAACACAACA TATCCAGTCA CTATGGCGGC CGCTAAGTTG GCAGCATCAC
541 CCGACGCACT TTGCGCCGAA TAAATACCTG TGACGGAAGA TCACTTCGCA GAATAAATAA
601 ATCCTGGTGT CCCTGTTGAT ACCGGGAAGC CCTGGGCCAA CTTTTCGCGA AAATGAGACG
661 TTGATCGGCA CGTAAGAGGT TCCAACCTTC ACCATAATGA AATAAGATCA CTACCGGGCG
721 TATTTTTTGA GTTATCGAGA TTTTCAGGAG CTAAGGAAGC TAAAAATGGAG AAAAAAATCA
781 CTGGATATAC CACCGTTGAT ATATCCCAAT GGCATCGTAA AGAACATTTT GAGGCATTTT
841 AGTCAGTTGC TCAATGTACC TATAACCAGA CCGTTCAGCT GGATATTACG GCCTTTTTTAA
901 AGACCGTAAA GAAAAATAAG CACAAGTTTT ATCCGGCCTT TATTCACATT CTGCCCCGCC
961 TGATGAATGC TCATCCGGAA TTCCGTATGG CAATGAAAGA CGGTGAGCTG GTGATATGGG
1021 ATAGTGTTCA CCCTTGTTAC ACCGTTTTCC ATGAGCAAAC TGAAACGTTT TCATCGCTCT
1081 GGAGTGAATA CCACGACGAT TTCCGGCAGT TTCTACACAT ATATTCGCAA GATGTGGCGT
1141 GTTACGGTGA AAACCTGGCC TATTTCCCTA AAGGGTTTAT TGAGAATATG TTTTTCGTCT
1201 CAGCCAATCC CTGGGTGAGT TTCACCAGTT TTGATTTAAA CGTGGCCAAT ATGGACAAC
1261 TCTTCGCCCC CGTTTTTCACC ATGGGCAAAAT ATTATACGCA AGGCGACAAG GTGCTGATGC
1321 CGCTGGCGAT TCAGGTTTCAT CATGCCGTCT GTGATGGCTT CCATGTCGGC AGAATGCTTA
1381 ATGAATTACA ACAGTACTGC GATGAGTGGC AGGGCGGGGC GTAAACGCGT GGATCCGGCT
1441 TACTAAAAGC CAGATAACAG TATGCGTATT TGCGCGCTGA TTTTTCGCGT ATAAGAATAT
1501 ATACTGATAT GTATACCCGA AGTATGTCAA AAAGAGGTGT GCTATGAAGC AGCGTATTAC
1561 AGTGACAGTT GACAGCGACA GCTATCAGTT GCTCAAGGCA TATATGATGT CAATATCTCC
1621 GGTCTGGTAA GCACAACCAT GCAGAATGAA GCGCGTCGTC TGCCTGCCGA ACGCTGGAAA
1681 GCGGAAAATC AGGAAGGGAT GGCTGAGGTC GCGCGGTTTA TTGAAATGAA CGGCTCTTTT
1741 GCTGACGAGA ACAGGGACTG GTGAAATGCA GTTTAAGGTT TACACCTATA AAAGAGAGAG
1801 CCGTTATCGT CTGTTTGTGG ATGTACAGAG TGATATTATT GACACGCCCC GGCGACGGAT
1861 GGTGATCCCC CTGGCCAGTG CACGTCTGCT GTCAGATAAA GTCTCCCGTG AACTTTACCC
1921 GGTGGTGCAT ATCGGGGATG AAAGCTGGCG CATGATGACC ACCGATATGG CCAGTGTGCC
1981 GGTCTCCGTT ATCGGGGAAG AAGTGGCTGA TCTCAGCCAC CGCGAAAATG ACATCAAAAA
2041 CGCCATTAAC CTGATGTTCT GGGGAATATA AATGTCAGGC TCCCTTATAC ACAGCCAGTC
2101 TGCAGGTCGA CCATAGTGAC TGGATATGTT GTGTTTTTACA GTATTATGTA GTCTGTTTTT
2161 TATGCAAAAT CTAATTTAAT ATATTGATAT TTATATCATT TTACGTTTCT CGTTCAGCTT
2221 TCTTGTAACA AGTGGTGATC GAGAAGTACT AGAGGATCAT AATCAGCCAT ACCACATTTG
2281 TAGAGGTTTT ACTTGCTTTA AAAAACCTCC CACACCTCCC CCTGAACCTG AAACATAAAA
2341 TGAATGCAAT TGTGTGTGTT AACTTGTTTA TTGCAGCTTA TAATGGTTAC AATAAAGCA
2401 ATAGCATCAC AAATTTTACA AATAAAGCAT TTTTTTCACT GCATTCTAGT TGTGGTTTGT
2461 CCAAACATCA CAATGTATCT TATCATGTCT GGATCTGATC ACTGCTTGAG CCTAGGAGAT
2521 CCGAACCAGA TAAGTGAAAT CTAGTTCCAA ACTATTTTGT CATTTTTTAA TTTTCGTATTA
2581 GCTTACGACG CTACACCCAG TTCCCATCTA TTTTGTCACT CTTCCCTAAA TAATCCTTAA-

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FIGURE 39B

2641 AAACCTCCATT TCCACCCCTC CCAGTTCCCA ACTATTTTGT CCGCCCACAG CGGGGCATTT
2701 TTCTTCCTGT TATGTTTTTA ATCAAACATC CTGCCAATC CATGTGACAA ACCGTCATCT
2761 TCGGCTACTT TTTCTCTGTC ACAGAATGAA AATTTTTCTG TCATCTCTTC GTTATTAATG
2821 TTTGTAATTG ACTGAATATC AACGCTTATT TGCAGCCTGA ATGGCGAATG GACGCGCCCT
2881 GTAGCGGCGC ATTAAGCGCG GCGGTGTGG TGGTTACGCG CAGCGTGACC GCTACACTTG
2941 CCAGCGCCCT AGCGCCCGCT CCTTTCGCTT TCTTCCCTTC CTTTCTCGCC ACGTTCGCCG
3001 GCTTTCCCGG TCAAGCTCTA AATCGGGGCG TCCCTTTAGG GTTCCGATTT AGTGCTTTAC
3061 GGCACCTCGA CCCCCAAAAA CTTGATTAGG GTGATGGTTC ACGTAGTGGG CCATCGCCCT
3121 GATAGACGGT TTTTCGCCCT TTGACGTTGG AGTCCACGTT CTTTAATAGT GGACTCTTGT
3181 TCCAACTGG AACAACTC AACCCTATCT CGGTCTATTC TTTTGATTTA TAAGGGATTT
3241 TGCCGATTTT GGCCTATTGG TTAATAAATG AGCTGATTTA AAAAAATTT AACGCGAATT
3301 TTAACAAAT ATTAACGTTT ACAATTTTCT GTGGCACTTT TCGGGGAAAT GTGCGCGGAA
3361 CCCCTATTTG TTTATTTTTC TAAATACATT CAAATATGTA TCCGCTCATG AGACAATAAC
3421 CCTGATAAAT GCTTCAATAA TATTGAAAAA GGAAGAGTAT GAGTATTCAA CATTTCCGTG
3481 TCGCCCTTAT TCCCTTTTTT GCGGCATTTT GCCTTCCTGT TTTTGCTCAC CCAGAAACGC
3541 TGGTGAAAGT AAAAGATGCT GAAGATCAGT TGGGTGCACG AGTGGGTAC ATCGAACTGG
3601 ATCTCAACAG CGGTAAGATC CTTGAGAGTT TCGCCCCGA AGAACGTTTT CCAATGATGA
3661 GCACTTTTAA AGTTCTGCTA TGTGGCGCGG TATTATCCCG TATTGACGCC GGGCAAGAGC
3721 AACTCGGTCT CCGCATACAC TATTCCTAGA ATGACTTGGT TGAGTACTCA CCAGTCACAG
3781 AAAAGCATCT TACGGATGGC ATGACAGTAA GAGAATTATG CAGTCTGCG ATAACCATGA
3841 GTGATAACAC TGCGGCCAAC TTACTTCTGA CAACGATCGG AGGACCGAAG GCGTAACCG
3901 CTTTTTTGCA CAACATGGGG GATCATGTAA CTCGCCTTGA TCGTTGGGAA CCGGAGCTGA
3961 ATGAAGCCAT ACCAAACGAC GAGCGTGACA CCACGATGCC TGTAGCAATG GCAACAACGT
4021 TGCGCAAAC ATTAACCTGGC GAACACTTCT CTCTAGCTTC CCGGCAACAA TTAATAGACT
4081 GGATGGAGGC GGATAAAGTT GCAGGACCAC TTCTGCGCTC GGCCCTTCCG GCTGGCTGGT
4141 TTATTGCTGA TAAATCTGGA GCCGGTGAGC GTGGGTCTCG CCGGTATCATT GCAGCACTGG
4201 GGCCAGATGG TAAGCCCTCC CGTATCGTAG TTATCTACAC GACGGGGAGT CAGGCAACTA
4261 TGGATGAACG AAATAGACAG ATCGCTGAGA TAGGTGCCTC ACTGATTAAG CATTGGTAAC
4321 TGTCAGACCA AGTTTACTCA TATATACTTT AGATTGATTT AAAACTTCAT TTTTAATTTA
4381 AAAGGATCTA GGTGAAGATC CTTTTTGATA ATCTCATGAC CAAAATCCCT TAACGTGAGT
4441 TTTCTGTTCCA CTGAGCGTCA GACCCCGTAG AAAAGATCAA AGGATCTTCT TGAGATCCTT
4501 TTTTCTGCG CGTAATCTGC TGCTTGCAA CAAAAAACC ACCGCTACCA GCGGTGGTTT
4561 GTTTGCCGGA TCAAGAGCTA CCAACTCTTT TTCCGAAGGT AACTGGCTTC AGCAGAGCGC
4621 AGATACCAAA TACTGTCTTT CTAGTGTAGC CGTAGTTAGG CCACCACTTC AAGAACTCTG
4681 TAGCACCGCC TACATACCTC GCTCTGCTAA TCCTGTTACC AGTGGCTGCT GCCAGTGGCG
4741 ATAAGTCGTG TCTTACCGGG TTGGACTCAG GACGATAGTT ACCGGATAAG GCGGACGGT
4801 CGGGCTGAAC GGGGGGTTTC TGCACACAA CCAGCTTGA GCGAACGACC TACACCGAAC
4861 TTGAGATACCT ACAGCGTGAG CATTGAGAAA GCGCCACGCT TCCCGAAGGG AGAAAGGCGG
4921 ACAGGTATCC GGTAAGCGGC AGGGTCGGAA CAGGAGAGCG CACGAGGGAG CTTCCAGGGG
4981 GAAACGCCTG GTATCTTTAT AGTCCTGTCT GGTTCGCCA CCTCTGACTT GAGCGTCGAT
5041 TTTTGTGATG CTCGTACGGG GGGCGGAGCC TATGGAAAAA CGCCAGCAAC GCGGCCTTTT
5101 TACGGTTCCT GGCCTTTTGC TGGCCTTTTG CTCACATGTT CTTTCTGCG TTATCCCTG
5161 ATTCTGTGGA TAACCGTATT ACCGCCTTTG AGTGAGCTGA TACCGCTCGC CGCAGCCGAA
5221 CGACCGAGCG CAGCGAGTCA GTGAGCGAGG AAGCGGAAGA GCGCCTGATG CGGTATTTTC
5281 TCCTTACGCA TCTGTGCGGT ATTTACACCC GCAGACCAGC CGCGTAACCT GGCAAAATCG
5341 GTTACGGTTG AGTAATAAAT GGATGCCCTG CGTAAGCGGG TGTGGGCGGA CAATAAAGTC
5401 TTAACCTGAA CAAAATAGAT CTAAACTATG ACAATAAAGT CTTAAACTAG ACAGAATAGT
5461 TGTAACCTGA AATCAGTCCA GTTATGCTGT GAAAAAGCAT ACTGGACTTT TGTATGGCT
5521 AAAGCAAAC CTTCATTTTC TGAAGTGCAA ATTGCCCGTC GTATTAAAGA GGGGCGTGGC
5581 CAAGGGCATG GTAAAGACTA TATTCGCGGC GTTGTGACAA TTTACCGAAC AACTCCGCGG
5641 CCGGGAAGCC GATCTCGGCT TGAAGCAATT GTTAGGTGGC GGTACTTGGG TCGATATCAA
5701 AGTGATCATC TTCTTCCCGT ATGCCCAACT TTGTATAGAG AGCCACTGCG GGATCGTCAC
5761 CGTAATCTGC TTGCACGTAG ATCACAATAAG CACCAAGCGC GTTGGCCTCA TGCTTGAGGA
5821 GATTGATGAG CGCGGTGGCA ATGCCCTGCC TCCGGTGCTC GCCGGAGACT GCGAGATCAT
5881 AGATATAGAT CTCACTACGC GGCTGCTCAA ACCTGGGCAG AACGTAAGCC GCGAGAGCGC
5941 CAACAACCGC TTCTTGCTCG AAGGCAGCAA GCGCGATGAA TGTCTTACTA CGGAGCAAGT
6001 TCCCGAGGTA ATCGGAGTCC GGCTGATGTT GGGAGTAGGT GGCTACGTCT CCGAACTCAC
6061 GACCGAAAAG ATCAAGAGCA GCCCGCATGG ATTTGACTTG GTCAGGGCCG AGCCTACATG-

Figure 39C

6061	AACTCTTTTT	CCGAAGGTAA	CTGGCTTCAG	CAGAGCGCAG	ATACCAAATA	CTGTCCTTCT
6121	AGTGTAGCEG	TAGTTAGGCC	ACCACTTCAA	GAACTCTGTA	GCACCGCCTA	CATACCTCGC
6181	TCTGCTAATC	CTGTTACCAG	TGGCTGCTGC	CAGTGGCGAT	AAGTCGTGTC	TTACCGGGTT
6241	GGACTCAAGA	CGATAGTTAC	CGGATAAGGC	GCAGCGGTCG	GGCTGAACGG	GGGGTTCGTG
6301	CACACAGCCC	AGCTTGGAGC	GAACGACCTA	CACCGAACTG	AGATACCTAC	AGCGTGAGCT
6361	ATGAGAAAGC	GCCACGCTTC	CCGAAGGGAG	AAAGGCGGAC	AGGTATCCGG	TAAGCGGCAG
6421	GGTCGGAACA	GGAGAGCGCA	CGAGGGAGCT	TCCAGGGGGA	AACGCCTGGT	ATCTTTATAG
6481	TCCTGTCGGG	TTTCGCCACC	TCTGACTTGA	GCGTCGATTT	TTGTGATGCT	CGTCAGGGGG
6541	GCGGAGCCTA	TGGA AAAACG	CCAGCAACGC	GGCCTTTTTA	CGGTTCCCTG	CCTTTTGCTG
6601	GCCTTTTGCT	CACATGTTCT	TTCTGCGTT	ATCCCCTGAT	TCTGTGGATA	ACCGTATTAC
6661	CGCCTTTGAG	TGAGCTGATA	CCGCTCGCCG	CAGCCGAACG	ACCGAGCGCA	GCGAGTCAGT
6721	GAGCGAGGAA	GCGGAAGAGC	GCCCAATACG	CAAACCGCCT	CTCCCCGCGC	GTTGGCCGAT
6781	TCATTAATGC	AGCTGGCACG	ACAGGTTTCC	CGACTGGAAA	GCGGGCAGTG	AGCGCAACGC
6841	AATTAATGTG	AGTTAGCTCA	CTCATTAGGC	ACCCCAGGCT	TTACACTTTA	TGCTTCCGGC
6901	TCGTATGTTG	TGTGGAATTG	TGAGCGGATA	ACAATTTTAC	ACAGGAAACA	GCTATGACCA
6961	TGATTACGCC	AAGCGCGCAA	TTAACCTCA	CTAAAGGGAA	CAAAAGCTGG	GTACCGGGCC
7021	CCCCCT					

FIGURE 31D

Figure 32A: pDEST12.2 CMV Promoter for Eukaryotic Expression, SV40 Promoter/ori for G418 Resistance

307 acc gtc aga tcg cct gga gac gcc atc cac gct gtt ttg acc tcc ata gaa
 tgg cag tct agc gga cct ctg cgg tag gtg cga caa aac tgg agg tat ctt

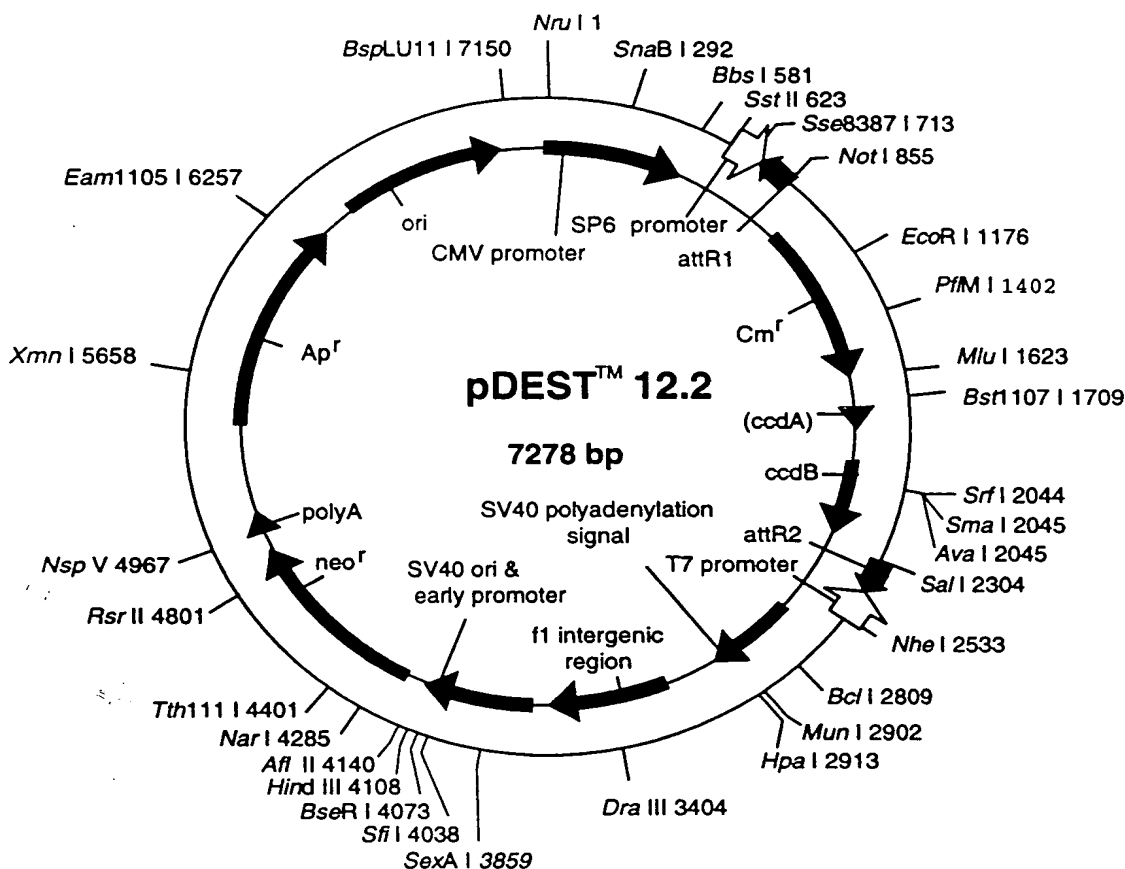
358 gac acc ggg acc gat cca gcc tcc gga ctc tag cct agg ccg cgg agc gga
 ctg tgg ccc tgg cta ggt cgg agg cct gag atc gga tcc ggc gcc tgc cct

409 taa caa ttt cac aca gga aac agc tat gac cat tag gcc ttt gca aaa agc
 att gtt aaa gtg tgt cct ttg tgc ata ctg gta atc cgg aaa cgt ttt tgc

460 tat tta ggt gac act ata gaa ggt acg cct gca ggt acc ggt ccg gaa ttc
 ata aat cca ctg tga tat ctt cca tgc gga cgt cca tgg cca ggc ctt aag

511 cca tca aca agt tgg taa ada ada gtt gaa cga gaa acg taa aat gat ata
 ggt agt tgt tca aac atg ttt ttt cga ctt gct ctt tgc att gta cta tat

Handwritten notes:
 mRNA from CMV promoter (above line 307)
 Age (above line 460)
 EcoRI (above line 460)
 Int (above line 511)
 attR1 (above line 511)



pDEST12.2 7278 bp (rotated to position 3900)

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
86..136	ori
220..742	CMV promoter
1059..935	attR1
1168..1827	CmR
1947..2031	inactivated ccdA
2169..2474	ccdB
2515..2639	attR2
2824..3186	small t & polyA
3310..3378	lac
4363..5157	neo
5680..6540	ampR

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1 GGGGGGCGGA GCCTATGGAA AAACGCCAGC AACGCGGCCT TTTTACGGTT CCTGGCCTTT
61 TGCTGGCCTT TTGCTCACAT GTTCTTTCCT GCGTTATCCC CTGATTCTGT GGATAACCGT
121 ATTACCGCCT TTGAGTGAGC TGATACCGCT CGCCGCAGCC GAACGACCGA GCGCAGCGAG
181 TCAGTGAGCG AGGAAGCGGA AGAGCTCGCG AATGCATGTC GTTACATAAC TTACGGTAAA
241 TGGCCCGCCT GGCTGACCGC CCAACGACCC CCGCCATTG ACGTCAATAA TGACGTATGT
301 TCCCATAAGT AGCCCAATAG GGACTTTCCA TTGACGTCAA TGGGTGGAGT ATTTACGGTA
361 AACTGCCCAC TTGGCAGTAC ATCAAGTGTA TCATATGCCA AGTACGCCCC CTATTGACGT
421 CAATGACGGT AAATGGCCCCG CCTGGCATTG TGCCCAGTAC ATGACCTTAT GGGACTTTCC
481 TACTTGGCAG TACATCTACG TATTAGTCAT CGCTATTACC ATGGTGATGC GGTTTTGGCA
541 GTACATCAAT GGGCGTGGAT AGCGGTTTGA CTCACGGGGA TTTCCAAGTC TCCACCCCAT
601 TGACGTCAAT GGGAGTTTGT TTTGGCACCA AAATCAACGG GACTTTCCAA AATGTCGTAA
661 CAACTCCGCC CCATTGACGC AAATGGGCGG TAGGCGTGTA CGGTGGGAGG TCTATATAAG
721 CAGAGCTCGT TTAGTGAACC GTCAGATCGC CTGGAGACGC CATCCACGCT GTTTTGACCT
781 CCATAGAAGA CACCGGGACC GATCCAGCCT CCGGACTCTA GCCTAGGCCG CGGGACGGAT
841 AACAATTTCA CACAGGAAAC AGCTATGACC ATTAGGCCTT TGCAAAAAGC TATTTAGGTG
901 ACACTATAGA AGGTACGCCT GCAGGTACCG GATCACAAGT TTGTACAAAA AAGCTGAACG
961 AGAAACGTAA AATGATATAA ATATCAATAT ATTAAATTAG ATTTTGATAA AAAACAGAC
1021 TACATAATAC TGTA AACAC AACATATCCA GTCATATGG CGGCCGATT AGGCACCCCA
1081 GGCTTTACAC TTTATGCTTC CGGCTCGTAT AATGTGTGGA TTTTGAGTTA GGATCCGTCG
1141 AGATTTTCAG GAGCTAAGGA AGCTAAAATG GAGAAAAAAA TCACTGGATA TACCACGTT
1201 GATATATCCC AATGGCATCG TAAAGAACAT TTTGAGGCAT TTCAGTCAGT TGCTCAATGT
1261 ACCTATAACC AGACCGTTCA GCTGGATATT ACGGCCTTTT TAAAGACCGT AAAGAAAAAT
1321 AAGCACAAGT TTTATCCGGC CTTTATTAC ATTCTTGCCC GCCTGATGAA TGCTCATCCG
1381 GAATTCCGTA TGGCAATGAA AGACGGTGAG CTGGTGATAT GGGATAGTGT TCACCCTTGT
1441 TACACCGTTT TCCATGAGCA AACTGAAACG TTTTCATCGC TCTGGAGTGA ATACCACGAC
1501 GATTTCCGGC AGTTTCTACA CATATATTCG CAAGATGTGG CGTGTTACGG TGA AACCTG
1561 GCCTATTTCC CTAAAGGGTT TATTGAGAAT ATGTTTTTCG TCTCAGCCAA TCCCTGGGTG
1621 AGTTTACCA GTTTTGATTT AAACGTGGCC AATATGGACA ACTTCTTCGC CCCC GTTTTC
1681 ACCATGGGCA AATATTATAC GCAAGGCGAC AAGGTGCTGA TGCCGCTGGC GATT CAGGTT
1741 CATCATGCCG TCTGTGATGG CTTCCATGTC GGCAGAATGC TTAATGAATT ACAACAGTAC
1801 TGCGATGAGT GGCAGGGCGG GGCCTAAACG CGTGGATCCG GCTTACTAAA AGCCAGATAA
1861 CAGTATGCGT ATTTGCGCGC TGATTTTTTG GGTATAAGAA TATATACTGA TATGTATACC
1921 CGAAGTATGT CAAAAGAGG TGTGCTATGA AGCAGCGTAT TACAGTGACA GTTGACAGCG
1981 ACAGCTATCA GTTGCTCAAG GCATATATGA TGTCAATATC TCCGGTCTGG TAAGCACAAC
2041 CATGCAGAAT GAAGCCCGTC GTCTGCGTGC CGAACGCTGG AAAGCGGAAA ATCAGGAAGG
2101 GATGGTCTAG GTCGCCCCGT TTATTGAAAT GAACGCTCT TTTGCTGACG AGAACAGGGA
2161 CTGGTGAAAT GCAGTTTAA GTTTACACCT ATAAAAGAGA GAGCCGTTAT CGTCTGTTTG
2221 TGGATGTACA GAGTGATATT ATTGACACGC CCGGGCGACG GATGGTGATC CCCCTGGCCA
2281 GTGCACGTCT GCTGTCAGAT AAAGTCTCCC GTGAACTTTA CCCGGTGGTG CATATCGGGG
2341 ATGAAAGCTG GCGCATGATG ACCACCGATA TGGCCAGTGT GCCGGTCTCC GTTATCGGGG
2401 AAGAAGTGGC TGATCTCAGC CACCGCGAAA ATGACATCAA AAACGCCATT AACCTGATGT-

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FIGURE 32B

2461 TCTGGGGAAT ATAAATGTCA GGCTCCCTTA TACACAGCCA GTCTGCAGGT CGACCATAGT
2521 GACTGGATAT GTTGTGTTTT ACAGTATTAT GTAGTCTGTT TTTTATGCAA AATCTAATTT
2581 AATATATTGA TATTTATATC ATTTTACGTT TCTCGTTCAG CTTTCTTGTA CAAAGTGGTG
2641 ATCGCGTGCA TGCGACGTCA TAGCTCTCTC CCTATAGTGA GTCGTATTAT AAGCTAGGCA
2701 CTGGCCGTCG TTTTACAACG TCGTGACTGG GAAAAC TGCT AGCTTGGGAT CTTTGTGAAG
2761 GAACCTTACT TCTGTGGTGT GACATAATTG GACAAACTAC CTACAGAGAT TTAAAGCTCT
2821 AAGGTAAATA TAAAATTTTT AAGTGTATAA TGTGTTAAAC TAGCTGCATA TGCTTGCTGC
2881 TTGAGAGTTT TGCTTACTGA GTATGATTTA TGAAAATATT ATACACAGGA GCTAGTGAAT
2941 CTAATTGTTT GTGTATTTTA GATTCACAGT CCCAAGGCTC ATTTTCAGGCC CCTCAGTCCCT
3001 CACAGTCTGT TCATGATCAT AATCAGCCAT ACCACATTTG TAGAGGTTTT ACTTGCTTTA
3061 AAAAACCTCC CACACCTCCC CCTGAACCTG AAACATAAAA TGAATGCAAT TGTTGTTGTT
3121 AACTTGTTTA TTGCAGCTTA TAATGGTTAC AAATAAAGCA ATAGCATCAC AAATTTTACA
3181 AATAAAGCAT TTTTTTCACT GCATTCTAGT TGTGGTTTGT CCAAACTCAT CAATGTATCT
3241 TATCATGTCT GGATCGATCC TGCATTAATG AATCGGCCAA CGCGCGGGGA GAGGCGGTTT
3301 GCGTATTGGC TGGCGTAATA GCGAAGAGGC CCGCACCGAT CGCCCTTCCC AACAGTTGCG
3361 CAGCCTGAAT GGCGAATGGG ACGCGCCCTG TAGCGGCGCA TTAAGCGCGG CGGGTGTGGT
3421 GGTTACGCGC AGCGTGACCG CTACACTTGC CAGCGCCCTA GCGCCCGCTC CTTTCGCTTT
3481 CTTCCCTTCC TTTCTCGCCA CGTTCGCCGG CTTTCCCCGT CAAGCTCTAA ATCGGGGGCT
3541 CCCTTTAGGG TTCCGATTTA GTGCTTTACG GCACCTCGAC CCCAAAAAAC TTGATTAGGG
3601 TGATGGTTCA CGTAGTGGGC CATCGCCCTG ATAGACGGTT TTTCCGCCCT TGACGTTGGA
3661 GTCCACGTTT TTTAATAGTG GACTCTTGTT CCAAACTGGA ACAACACTCA ACCCTATCTC
3721 GGTCTATTCT TTTGATTTAT AAGGGATTTT GCCGATTTTC GCCTATTGGT TAAAAAATGA
3781 GCTGATTTAA CAAATATTTA ACGCGAATTT TAACAAAATA TTAACGTTTA CAATTTTCGCC
3841 TGATGCGGTA TTTTCTCCTT ACGCATCTGT GCGGTATTTT ACACCGCATC CGCGGATCTG
3901 CGCAGCACCA TGGCCTGAAA TAACCTCTGA AAGAGGAACT TGGTTAGGTA CCTTCTGAGG
3961 CGGAAAGAAC CAGCTGTGGA ATGTGTGTCA GTTAGGGTGT GGAAAGTCCC CAGCTCCCC
4021 AGCAGGCAGA AGTATGCAAA GCATGCATCT CAATTAGTCA GCAACCAGGT GTGGAAGTGC
4081 CCCAGGCTCC CCAGCAGGCA GAAGTATGCA AAGCATGCAT CTCAATTAGT CAGCAACCAT
4141 AGTCCCGCCC CTAACTCCGC CCATCCCGCC CCTAACTCCG CCCAGTTCCG CCCATTCTCC
4201 GCCCCATGGC TGACTAATTT TTTTATTTA TGCAGAGGCC GAGGCCGCCT CGGCCTCTGA
4261 GCTATTCCAG AAGTAGTGAG GAGGCTTTTT TGGAGGCCTA GGCTTTTGCA AAAAGCTTGA
4321 TTCTTCTGAC ACAACAGTCT CGAACTTAAG GCTAGAGCCA CCATGATTGA ACAAGATGGA
4381 TTGCACGCAG GTTCTCCGGC CGCTTGGGTG GAGAGGCTAT TCGGCTATGA CTGGGCACAA
4441 CAGACAATCG GCTGCTCTGA TGCCGCCGTG TTCCGGCTGT CAGCGCAGGG GCGCCCGGTT
4501 CTTTTTGTCA AGACCGACCT GTCCGGTGCC CTGAATGAAC TGCAGGACGA GGCAGCGCGG
4561 CTATCGTGCG TGGCCACGAC GGGCGTTCCT TGCGCAGCTG TGCTCGACGT TGCTACTGAA
4621 GCGGGAAGGG ACTGGCTGCT ATTGGGCGAA GTGCCGGGGC AGGATCTCCT GTCATCTCAC
4681 CTTGCTCCTG CCGAGAAAGT ATCCATCATG GCTGATGCAA TGCGGCGGCT GCATACGCTT
4741 GATCCGGCTA CTGCCCCATT CGACCACCAA CGGAAACATC GCATCGAGCG AGCAGTACT
4801 CGGATGGAAG CCGGTCTTGT CGATCAGGAT GATCTGGACG AAGAGCATCA GGGGCTCGCG
4861 CCAGCCGAAC TGTTCCGCCAG GCTCAAGGCG CGCATGCCCC ACGGCGAGGA TCTCGTCGTG
4921 ACCCATGGCG ATGCCTGCTT GCCGAATATC ATGGTGGAAG ATGGCCGCTT TTCTGGATT
4981 ATCGACTGTG GCCGGCTGGG TGTGGCGGAC CGCTATCAGG ACATAGCGTT GGCTACCCGT
5041 GATATTGCTG AAGAGCTTGG CCGCGAATGG GCTGACCGCT TCCTCGTGCT TTACGGTATC
5101 GCCGCTCCCG ATTTCGAGCG CATCGCCTTC TATCGCCTTC TTGACGAGTT CTTCTGAGCG
5161 GGACTCTGGG GTTCGAAATG ACCGACCAAG CGACGCCCAA CCTGCCATCA CGATGGCCGC
5221 AATAAAATAT CTTTATTTTC ATTACATCTG TGTGTTGGTT TTTTGTGTGA ATCGATAGCG
5281 ATAAGGATCC GCGTATGGTG CACTCTCAGT ACAATCTGCT CTGATGCCGC ATAGTTAAGC
5341 CAGCCCCGAC ACCCGCCAAC ACCCGCTGAC GCGCCCTGAC GGGCTTGCTCT GCTCCCGGCA
5401 TCCGCTTACA GACAAGCTGT GACCGTCTCC GGGAGCTGCA TGTGTCAGAG GTTTTACCCG
5461 TCATCACCAG AACGCGCGAG ACGAAAGGGC CTCGTGATAC GCCTATTTTT ATAGGTTAAT
5521 GTCATGATAA TAATGGTTTC TTAGACGTCA GGTGGCACTT TTCGGGGAAA TGTGCGCGGA
5581 ACCCTATTTT GTTTATTTTT CTAAATACAT TCAAATATGT ATCCGCTCAT GAGACAATAA
5641 CCCTGATAAA TGCTTCAATA ATATTGAAAA AGGAAGAGTA TGAGTATTCA ACATTTCCGT
5701 GTCGCCCTTA TTCCCTTTTT TGCGGCATTT TGCCTTCTTG TTTTGTCTCA CCCAGAAACG
5761 CTGGTGAAAG TAAAAGATGC TGAAGATCAG TTGGGTGCAC GAGTGGGTTA CATCGAACTG
5821 GATCTCAACA GCGGTAAAGAT CCTTGAGAGT TTTCCGCCCG AAGAAGTTTT TCCAATGATG
5881 AGCACTTTTA AAGTTCTGCT ATGTGGCGCG GTATTATCCC GTATTGACGC CGGGCAAGAG-

FIGURE 32C

Figure 40A: pDEST20 Glutathione-S-transferase Fusion with Polyhedron Promoter for Baculovirus Expression

430 ggc tac gta tac tcc gga ata tta ata gat cat gga gat aat taa aat gat
ccg atg cat atg agg cct tat aat tat cta gta cct cta tta att tta cta

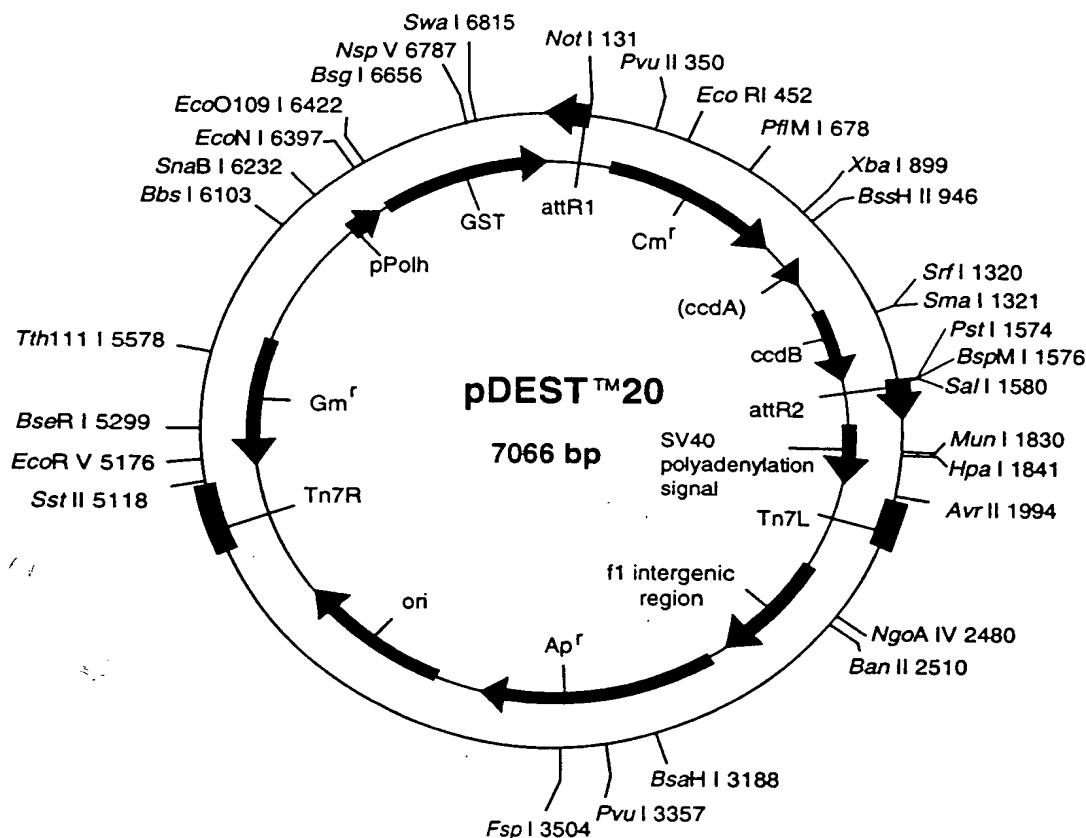
481 "aac cat ctc gca aat aaa taa gta ttt tac tgt ttt cgt aac agt ttt gta
"ttg gta gag cgt tta ttt att cat aaa atg aca aaa gca ttg tca aaa cat

532 "ata aaa aaa cct ata aat att ccg gat tat tca tac cgt ccc acc atc ggg
tat ttt ttt gga tat tta taa ggc cta ata agt atg gca ggg tgg tag ccc

Start Transl. → A P I - - - GST- -
583 cgc gga tcc atg gcc cct ata cta ggt tat tgg aaa att aag ggc ctt gtg
gcg cct agg tac cgg gga tat gat cca ata acc ttt taa ttc ccg gaa cac //

1246 S D L V P R H N Q T S L Y K K A
tcg gat ctg gtt ccg cgt cat aat caa aca agt ttg tac aaa aaa gct gaa
agc cta gac caa ggc gca gta tta gtt tgt tca aac atg ttt ttt cga ctt

1297 cga gaa acg taa aat gat ata aat atc aat ata tta aat tag at
gct ctt tgc att tta cta tat tta tag tta tat aat tta atc ta



002020 00427550

pDEST20 7066 bp (rotated to position 5800)

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
592..1263	GST
1397..1273	attR1
1506..2165	CmR
2285..2369	inactivated ccdA
2507..2812	ccdB
2853..2977	attR2
4214..5064	ampR
5263..5843	ori

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1  CCACTGCGCC GTTACCACCG CTGCGTTCGG TCAAGGTTCT GGACCAGTTG CGTGAGCGCA
61 TACGCTACTT GCATTACAGT TTACGAACCG AACAGGCTTA TGTCAACTGG GTTCGTGCCT
121 TCATCCGTTT CCACGGTGTG CGTCACCCGG CAACCTTGGG CAGCAGCGAA GTCGAGGCAT
181 TTCTGTCCTG GCTGGCGAAC GAGCGCAAGG TTTCGGTCTC CACGCATCGT CAGGCATTGG
241 CGGCCTTGCT GTTCTTCTAC GGCAAGGTGC TGTGCACGGA TCTGCCCTGG CTTCAGGAGA
301 TCGGAAGACC TCGGCCGTCG CGGCGCTTGC CGGTGGTGCT GACCCCGGAT GAAGTGGTTC
361 GCATCCTCGG TTTTCTGGAA GGCGAGCATC GTTTGTTTCGC CCAGGACTCT AGCTATAGTT
421 CTAGTGTTTG GCTACGTATA CTCCGGAATA TTAATAGATC ATGGAGATAA TTAATATGAT
481 AACCATCTCG CAAATAAATA AGTATTTTAC TGTTTTCGTA ACAGTTTTGT AATAAAAAAA
541 CCTATAAATA TTCCGGATTA TTCATACCGT CCCACCATCG GGCGCGGATC CATGGCCCCT
601 ATACTAGGTT ATTGGAAAAT TAAGGGCCTT GTGCAACCCA CTCGACTTCT TTTGGAATAT
661 CTTGAAGAAA AATATGAAGA GCATTTGTAT GAGCGCGATG AAGGTGATAA ATGGCGAAAC
721 AAAAAGTTTG AATTGGGTTT GGAGTTTCCC AATCTTCCTT ATTATATTGA TGGTGATGTT
781 AAATTAACAC AGTCTATGGC CATCATACGT TATATAGCTG ACAAGCACAA CATGTTGGGT
841 GGTGTCCAA AAGAGCGTGC AGAGATTTC AATGCTGAAG GAGCGGTTTT GGATATTAGA
901 TACGGTGTTT CGAGAATTGC ATATAGTAAA GACTTTGAAA CTCTCAAAGT TGATTTTCTT
961 AGCAAGCTAC CTGAAATGCT GAAAATGTTT GAAGATCGTT TATGTCATAA AACATATTTA
1021 AATGGTGATC ATGTAACCCA TCCTGACTTC ATGTTGTATG ACGTCTTGA TGTGTTTTTA
1081 TACATGGACC CAATGTGCCT GGATGCGTTC CAAAATTAG TTTGTTTTAA AAAACGTATT
1141 GAAGCTATCC CACAAATTGA TAAGTACTTG AAATCCAGCA AGTATATAGC ATGGCCTTTG
1201 CAGGGCTGGC AAGCCACGTT TGGTGGTGGC GACCATCCTC CAAAATCGGA TCTGGTTCCG
1261 CGTCATAATC AAACAAGTTT GTACAAAAAA GCTGAACGAG AAACGTAAAA TGATATAAAT
1321 ATCAATATAT TAAATTAGAT TTTGCATAAA AAACAGACTA CATAATACTG TAAAACACAA
1381 CATATCCAGT CACTATGGCG GCCGCATTAG GCACCCAGG CTTTACACTT TATGCTTCCG
1441 GCTCGTATGT TGTGTGGATT TTGAGTTAGG ATCCGGCGAG ATTTTCAGGA GCTAAGGAAG
1501 CTAAAATGGA GAAAAAATC ACTGGATATA CCACCGTTGA TATATCCCAA TGGCATCGTA
1561 AAGAACATTT TGAGGCATTT CAGTCAGTTG CTCAATGTAC CTATAACCAG ACCGTTTCAGC
1621 TGGATATTAC GGCCTTTTTA AAGACCGTAA AGAAAAATAA GCACAAGTTT TATCCGGCCT
1681 TTATTCACAT TCTTGCCCGC CTGATGAATG CTCATCCGGA ATTCCGTATG GCAATGAAAG
1741 ACGGTGAGCT GGTGATATGG GATAGTGTTT ACCCTTGTTA CACCGTTTTT CATGAGCAAA
1801 CTGAAACGTT TTCATCGCTC TGGAGTGAAT ACCACGACGA TTTCCGGCAG TTTCTACACA
1861 TATATTCGCA AGATGTGGCG TGTTACGGTG AAAACCTGGC CTATTTCCCT AAAGGGTTTA
1921 TTGAGAATAT GTTTTTTCGTC TCAGCCAATC CCTGGGTGAG TTTCACCACT TTTGATTTAA
1981 ACGTGGCCAA TATGGACAAC TTCTTCGCCC CCGTTTTTCAC CATGGGCAAA TATTATACGC
2041 AAGGCGACAA GGTGCTGATG CCGCTGGCGA TTCAGGTTCA TCATGCCGTC TGTGATGGCT
2101 TCCATGTCGG CAGAATGCTT AATGAATTAC AACAGTACTG CGATGAGTGG CAGGGCGGGG
2161 CGTAATCTAG AGGATCCGGC TTAATAAAAG CCAGATAACA GTATGCGTAT TTGCGCGCTG
2221 ATTTTTGCGG TATAAGAATA TATACTGATA TGTATACCCG AAGTATGTCA AAAAGAGGTG
2281 TGCTATGAAG CAGCGTATTA CAGTGACAGT TGACAGCGAC AGCTATCAGT TGCTCAAGGC
2341 ATATATGATG TCAATATCTC CGGTCTGGTA AGCACAACCA TGCAGAATGA AGCCCGTCGT
2401 CTGCGTGCCG AACGCTGGAA AGCGGAAAAT CAGGAAGGGA TGGCTGAGGT CGCCCGGTTT
2461 ATTGAAATGA ACGGCTCTTT TGCTGACGAG AACAGGGACT GGTGAAATGC AGTTTAAGGT
2521 TTACACCTAT AAAAGAGAGA GCCGTTATCG TCTGTTTGTG GATGTACAGA GTGATATTAT
2581 TGACACGCCC GGGCGACGGA TGGTGATCCC CCTGGCCAGT GCACGTCTGC TGTGAGATAA
2641 AGTCTCCCGT GAACTTTACC CGGTGGTGCA TATCGGGGAT GAAAGCTGGC GCATGATGAC-

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Figure 40B


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2701 CACCGATATG GCCAGTGTGC CGGTCTCCGT TATCGGGGAA GAAGTGGCTG ATCTCAGCCA
2761 CCGCGAAAAT GACATCAAAA ACGCCATTAA CCTGATGTTT TGGGGAATAT AAATGTCAGG
2821 CTCCCTTATA CACAGCCAGT CTGCAGGTCG ACCATAGTGA CTGGATATGT TGTGTTTTAC
2881 AGTATTATGT AGTCTGTTTT TTATGCAAAA TCTAATTTAA TATATTGATA TTTATATCAT
2941 TTTACGTTTC TCGTTCAGCT TTCTTGTAACA AAGTGGT'TTG ATAGCTTGTC GAGAAGTACT
3001 AGAGGATCAT AATCAGCCAT ACCACATTTG TAGAGGTTTT ACTTGCTTTA AAAAACCTCC
3061 CACACCTCCC CCTGAACCTG AAACATAAAA TGAATGCAAT TGT'TGTTGTT AACTTGTTTA
3121 TTGCAGCTTA TAATGGTTAC AAATAAAGCA ATAGCATCAC AAATTTTACA AATAAAGCAT
3181 TTTTTTCACT GCATTCTAGT TGTGGTTTGT CCAAACTCAT CAATGTATCT TATCATGTCT
3241 GGTACTGTATC ACTGCTTGAG CCTAGGAGAT CCGAACCAGA TAAGTGAAAT CTAGTTCCAA
3301 ACTATTTTGT CATTTTAAAT TTTCGTATTA GCTTACGACG CTACACCCAG TTCCCATCTA
3361 TTTTGTCACT CTTCCCTAAA TAATCCTTAA AAACCTCCAT TCCACCCCTC CCAGTTCCCA
3421 ACTATTTTGT CCGCCACAG CGGGGCATTT TTCTTCCTGT TATGTTTTTA ATCAAACATC
3481 CTGCCAACTC CATGTGACAA ACCGTCATCT TCGGCTACTT TTTCTCTGTC ACAGAATGAA
3541 AATTTTTCTG TCATCTCTTC GTTATTAATG TTTGTAATTG ACTGAATATC AACGCTTATT
3601 TGCAGCCTGA ATGGCGAATG GACGCGCCCT GTAGCGGCGC ATTAAGCGCG GCGGGTGTGG
3661 TGGTTACGCG CAGCGTGACC GCTACACTTG CCAGCGCCCT AGCGCCCGCT CCTTTCGCTT
3721 TCTTCCCTTC CTTTCTCGCC ACGTTCGCGG GCTTCCCCG TCAAGCTCTA AATCGGGGGC
3781 TCCCTTTAGG GTTCCGATTT AGTGCTTTAC GGCACCTCGA CCCCCAAAAA CTTGATTAGG
3841 GTGATGGTTC ACGTAGTGGG CCATCGCCCT GATAGACGGT TTTTCGCCCT TTGACGTTGG
3901 AGTCCACGTT CTTTAATAGT GGACTCTTGT TCCAAACTGG AACAACTC AACCCATCT
3961 CGGTCTATTC TTTTGATTTA TAAGGGATTT TGCCGATTTT GGCCTATTGG TTAATAAATG
4021 AGCTGATTTA ACAAAAATTT AACCGCAATT TTAACAAAAT ATTAACGTTT ACAATTCAG
4081 GTGGCACTTT TCGGGGAAAT GTGCGCGGAA CCCCTATTTG TTTATTTTTC TAAATACATT
4141 CAAATATGTA TCCGCTCATG AGACAATAAC CCTGATAAAT GCTTCAATAA TATTGAAAAA
4201 GGAAGAGTAT GAGTATTCAA CATTTCCGTG TCGCCCTTAT TCCCTTTTTT GCGGCATTTT
4261 GCCTTCCTGT TTTTGCTCAC CCAGAAACGC TGGTGAAAGT AAAAGATGCT GAAGATCAGT
4321 TGGGTGCACG AGTGGGTAC ATCGAACTGG ATCTCAACAG CGGTAAGATC CTTGAGAGTT
4381 TTCGCCCCGA AGAACGTTTT CCAATGATGA GCACTTTTAA AGTTCTGCTA TGTGGCGCGG
4441 TATTATCCCG TATTGACGCC GGGCAAGAGC AACTCGGTCT CCGCATACAC TATTCTCAGA
4501 ATGACTTGGT TGAGTACTCA CCAGTCACAG AAAAGCATCT TACGGATGGC ATGACAGTAA
4561 GAGAATTATG CAGTGCTGCC ATAACCATGA GTGATAACAC TGCGGCCAAC TTACTTCTGA
4621 CAACGATCGG AGGACCGAAG GAGCTAACCG CTTTTTTGCA CAACATGGGG GATCATGTAA
4681 CTCGCCTTGA TCGTTGGGAA CCGGAGCTGA ATGAAGCCAT ACCAAACGAC GAGCGTGACA
4741 CCACGATGCC TGTAGCAATG GCAACAACGT TGCGCAAAC ATTAACGGC GAACTACTTA
4801 CTCTAGCTTC CCGGCAACAA TTAATAGACT GGATGGAGGC GGATAAAGTT GCAGGACCAC
4861 TTCTGCGCTC GGCCCTTCCG GCTGGCTGGT TTATTGCTGA TAAATCTGGA CCGGTGTAGC
4921 GTGGGTCTCG CGGTATCATT GCAGCACTGG GGCCAGATGG TAAGCCCTCC CCTATCTAG
4981 TTATCTACAC GACGGGGAGT CAGGCAACTA TGGATGAACG AAATAGACAG ATCGCTGAGA
5041 TAGGTGCCTC ACTGATTAAG CATTGGTAAC TGTCAGACCA AGTTTACTCA TATATACTTT
5101 AGATTGATTT AAAACTTCAT TTTTAATTTA AAAGGATCTA GGTGAAGATC CTTTTTGATA
5161 ATCTCATGAC CAAAATCCCT TAACGTGAGT TTTTCGTTCCA CTGAGCGTCA GACCCCGTAG
5221 AAAAGATCAA AGGATCTTCT TGAGATCCTT TTTTCTGCG CGTAATCTGC TGCTTGCAAA
5281 CAAAAAACCC ACCGCTACCA GCGGTGGTTT GTTTGCCGGA TCAAGAGCTA CCAACTCTTT
5341 TTCCGAAGGT AACTGGCTTC AGCAGAGCGC AGATAACAAA TACTGTCCTT CTAGTGTAGC
5401 CGTAGTTAGG CCACCACTTC AAGAACTCTG TAGCACCGCC TACATACCTC GCTCTGCTAA
5461 TCCTGTTACC AGTGGCTGCT GCCAGTGGCG ATAAGTCGTG TCTTACCGGG TTGGACTCAA
5521 GACGATAGTT ACCGGATAAG GCGCAGCGGT CGGGCTGAAC GGGGGGTTCTG TGCACACAGC
5581 CCAGCTTGGA GCGAACGACC TACACCGAAC TGAGATACCT ACAGCGTGAG CATTGAGAAA
5641 GCGCCACGCT TCCCGAAGGG AGAAAGGCGG ACAGGTATCC GGTAAGCGGC AGGGTCGGAA
5701 CAGGAGAGCG CACGAGGGAG CTTCCAGGGG GAAACGCCTG GTATCTTTAT AGTCCTGTCTG
5761 GGTTTCGCCA CCTCTGACTT GAGCGTCGAT TTTTGTGATG CTCGTAGGG GGGCGAGCC
5821 TATGAAAAAA CGCCAGCAAC GCGGCC'TTTT TACGGTTCCT GGCCTTTTGC TGGCCTTTTG
5881 CTCACATGTT CTTTCCCTGCG TTATCCCTTG ATTCTGTGGA TAACCGTATT ACCGCCTTTG
5941 AGTGAGCTGA TACCGCTCGC CGCAGCCGAA CGACCGAGCG CAGCGAGTCA GTGAGCGAGG
6001 AAGCGGAAGA GCGCCTGATG CGGTATTTTC TCCTTACGCA TCTGTGCGGT ATTTACACCC
6061 GCAGACCAGC CGCGTAACCT GGCAAAATCG GTTACGGTTG AGTAATAAAT GGATGCCCTG
6121 CGTAAGCGGG TGTGGGCGGA CAATAAAGTC TTAAACTGAA CAAAATAGAT CTAAACTATG-

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Figure 40C

6181 ACAATAAAGT CTTAAACTAG ACAGAATAGT TGTAAGCTGA AATCAGTCCA GTTATGCTGT
 6241 GAAAAAGCAT ACTGGACTTT TGTTATGGCT AAAGCAAACCT CTTCAATTTTC TGAAGTGCAA
 6301 ATTGCCCCGTC GTATTAAAGA GGGGCGTGGC CAAGGGCATG GTAAAGACTA TATTCGCGGC
 6361 GTTGTGACAA TTTACCGAAC AACTCCGCGG CCGGGAAGCC GATCTCGGCT TGAACGAATT
 6421 GTTAGGTGGC GGTACTTGGG TCGATATCAA AGTGCATCAC TTCTTCCCGT ATGCCCAACT
 6481 TTGTATAGAG AGCCACTGCG GGATCGTCAC CGTAATCTGC TTGCACGTAG ATCACATAAG
 6541 CACCAAGCGC GTTGGCCTCA TGCTTGAGGA GATTGATGAG CGCGGTGGCA ATGCCCTGCC
 6601 TCCGGTGCTC GCCGGAGACT GCGAGATCAT AGATATAGAT CTCACTACGC GGCTGCTCAA
 6661 ACCTGGGCAG AACGTAAGCC GCGAGAGCGC CAACAACCGC TTCTTGGTCC AAGGCAGCAA
 6721 GCGCGATGAA TGTCTTACTA CGGAGCAAGT TCCCGAGGTA ATCGGAGTCC GGCTGATGTT
 6781 GGGAGTAGGT GGCTACGTCT CCGAACTCAC GACCGAAAAG ATCAAGAGCA GCCCGCATGG
 6841 ATTTGACTTG GTCAGGGCCG AGCCTACATG TGCGAATGAT GCCCATACTT GAGCCACCTA
 6901 ACTTTGTTTT AGGGCGACTG CCCTGCTGCG TAACATCGTT GCTGCTGCGT AACATCGTTG
 6961 CTGCTCCATA ACATCAAACA TCGACCCACG GCGTAACGCG CTTGCTGCTT GGATGCCCCA
 7021 GGCATAGACT GTACAAAAAA ACAGTCATAA CAAGCCATGA AAACCG

6181 6241 6301 6361 6421 6481 6541 6601 6661 6721 6781 6841 6901 6961 7021

FIGURE 40D

ADH Promoter

700 ~~ttg gcg ctt tgg tat gaa gta taa ata gac ctg caa tta tta atc ttt tgt~~
~~aac ggc gaa acg ata gtt cat att tat ctg gac gtt aat aat tag aaa aca~~

751 ~~ttc ctc gtc att gtt ctc gtt ccc ttt ctt cct tgt ttc ttt ttc tgc aca~~
~~aag gag cag taa caa gag caa ggg aaa gaa gga aca aag aaa aag acg tgt~~

802 ~~ata ttt caa gct ata cca agc ata caa tca act~~ cca agc ttg aag caa gcc
~~tat aaa gtt cga tat ggt tgg tat gtt agt tga~~ ggt tgg aac ttc gtt cgg

Start Transl M K L L S S - - Gal4-DB

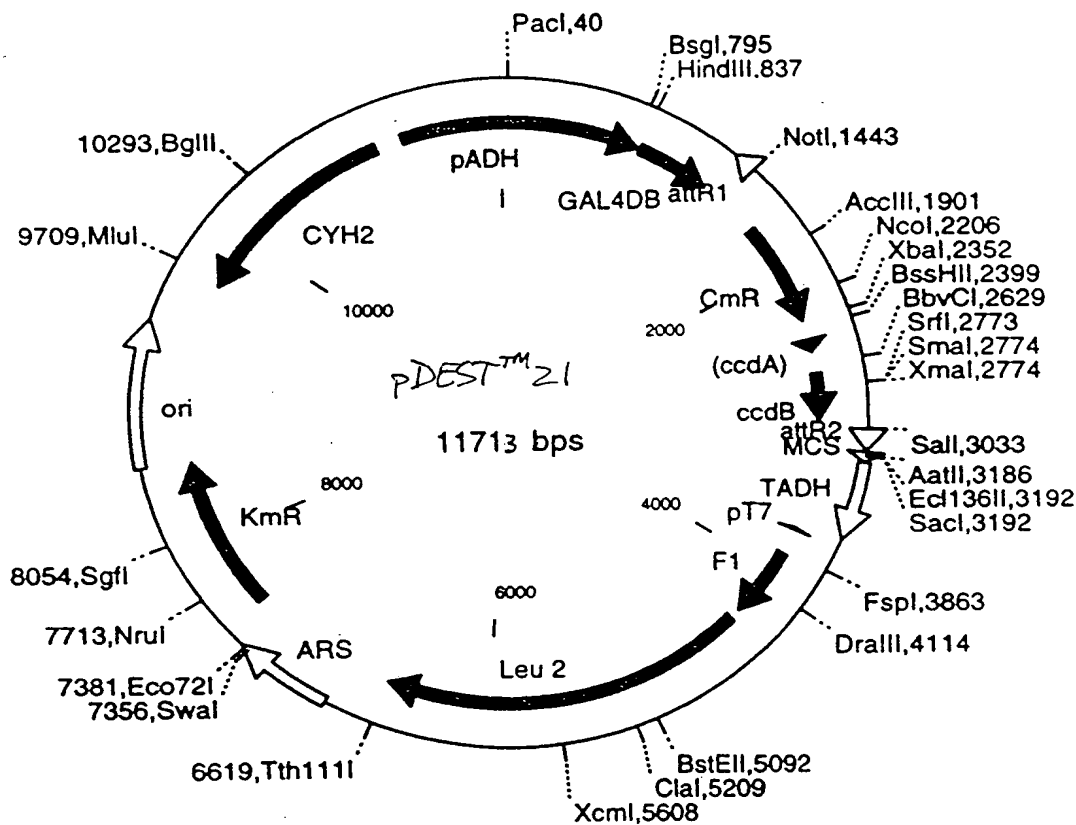
853 tcc tga aag tgt aag cta ctg tct tct atc gaa caa gca tgc gat att tgg//
agg act ttc tac ttc gat gac aga aga tag ctt gtt cgt acg cta taa acg//

...

1261 gaa gag agt agt aac aaa ggt caa aga cag - ttg act gta tgg tgg agg tgg
ctt ctc tca tca ttg ttt cca gtt tct gtc aac tga cat agc agc tcc agc

1312 N Q T S L Y K K A att RI
aat caa aca agt tgg tac aaa aaa gct gaa cga gaa acg taa aat gat ata//
tta gtt tgt tca aac atg ttt ttt cga ctt gct ctt tgc att tta cta tat//

Int ↓



pDEST21 11713 bp (rotated to position 11000)

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
857..1322	GAL4DB
1456..1332	attR1
1706..2365	CmR
2485..2569	inactivated ccdA
2707..3012	ccdB
3053..3177	attR2
3716..3735	pT7 (T7 promoter)
3899..4354	f1 (f1 intergenic region)
4414..6642	Leu2
7541..8515	kanR
9668..10958	CYH2
11118..848	pADH (ADH promoter)

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1 TTTATTATGT TACAATATGG AAGGGAACTT TACACTTCTC CTATGCACAT ATATTAATTA
61 AAGTCCAATG CTAGTAGAGA AGGGGGGTAA CACCCCTCCG CGCTCTTTTC CGATTTTTTTT
121 CTAAACCGTG GAATATTTTCG GATATCCTTT TGTTGTTTCC GGGTGTACAA TATGGACTTC
181 CTCTTTTCTG GCAACCAAAC CCATACATCG GGATTCTAT AATACCTTCG TTGGTCTCCC
241 TAACATGTAG GTGGCGGAGG GGAGATATAC AATAGAACAG ATACCAGACA AGACATAATG
301 GGCTAAACAA GACTACACCA ATTACACTGC CTCATTGATG GTGGTACATA ACGAACTAAT
361 ACTGTAGCCC TAGACTTGAT AGCCATCATC ATATCGAAGT TTTCTACCC TTTTTCATT
421 TGCCATCTAT TGAAGTAATA ATAGGCGCAT GCAACTTCTT TTCTTTTTTTT TTCTTTTCTC
481 TCTCCCCCGT TGTGTCTCA CCATATCCGC AATGACAAAA AAAATGATGG AAGACACTAA
541 AGGAAAAAAT TAACGACAAA GACAGCACCA ACAGATGTCG TTGTTCCAGA GCTGATGAGG
601 GGTATCTTCG AACACACGAA ACTTTTTTCT TCCTTCATTC ACGCACACTA CTCTCTAATG
661 AGCAACGGTA TACGGCCTTC CTTCCAGTTA CTTGAATTTG AAATAAAAAA AGTTTGCCGC
721 TTTGCTATCA AGTATAAATA GACCTGCAAT TATTAATCTT TTGTTTCCTC GTCATTGTTC
781 TCGTTCCTT TCTTCCTTGT TTCTTTTTTCT GCACAATATT TCAAGCTATA CCAAGCATAC
841 AATCAACTCC AAGCTTGAAG CAAGCCTCCT GAAAGATGAA GCTACTGTCT TCTATCGAAC
901 AAGCATGCGA TATTTGCCGA CTTAAAAAGC TCAAGTGCTC CAAAGAAAAA CCGAAGTGCG
961 CCAAGTGTCT GAAGAACAAC TGGGAGTGTC GCTACTCTCC CAAAACCCAA AGGTCTCCGC
1021 TGACTAGGGC ACATCTGACA GAAGTGAAT CAAGGCTAGA AAGACTGGAA CAGCTATTTT
1081 TACTGATTTT TCCTCGAGAA GACCTTGACA TGATTTTGAA AATGGATTCT TTACAGGATA
1141 TAAAAGCATT GTTAACAGGA TTATTTGTAC AAGATAATGT GAATAAAGAT GCCGTCACAG
1201 ATAGATTGGC TTCAGTGGAG ACTGATATGC CTCTAACATT GAGACAGCAT AGAATAAGTG
1261 CGACATCATC ATCGGAAGAG AGTAGTAACA AAGGTCAAAG ACAGTTGACT GTATCGTCGA
1321 GGTCGAATCA AACAAGTTTG TACAAAAAAG CTGAACGAGA AACGTAAAAA GATATAAATA
1381 TCAATATATT AAATTAGATT TTGCATAAAA AACAGACTAC ATAATACTGT AAAACACAAC
1441 ATATCCAGTC ACTATGGCGG CCGCTAAGTT GGCAGCATCA CCCGACGCAC TTTGCGCCGA
1501 ATAAATACCT GTGACGGAAG ATCACTTCGC AGAATAAATA AATCCTGGTG TCCCTGTTGA
1561 TACCGGGAAG CCCTGGGCCA ACTTTTGGCG AAAATGAGAC GTTGATCGGC ACGTAAGAGG
1621 TTCCAACTTT CACCATAATG AAATAAGATC ACTACCGGGC GTATTTTTTTG AGTTATCGAG
1681 ATTTTCAGGA GCTAAGGAAG CTAAATGGA GAAAAAATC ACTGGATATA CCACCGTTGA
1741 TATATCCCAA TGGCATCGTA AAGAACATTT TGAGGCATTT CAGTCAGTTG CTCAATGTAC
1801 CTATAACCAG ACCGTTTCAGC TGGATATTAC GGCCTTTTTA AAGACCGTAA AGAAAAATAA
1861 GCACAAGTTT TATCCGGCCT TTATTACAT TCTTGCCCGC CTGATGAATG CTCATCCGGA
1921 ATTCCGTATG GCAATGAAAG ACGGTGAGCT GGTGATATGG GATAGTGTTT ACCCTTGTTA
1981 CACCGTTTTT CATGAGCAAA CTGAAACGTT TTCATCGCTC TGGAGTGAAT ACCACGACGA
2041 TTTCCGGCAG TTTCTACACA TATATTCGCA AGATGTGGCG TGTTACGGTG AAAACCTGGC
2101 CTATTTCCCT AAAGGGTTTA TTGAGAATAT GTTTTTTCGT TCAGCCAATC CCTGGGTGAG
2161 TTTCAACAGT TTTGATTTAA ACGTGGCCAA TATGGACAAC TTCTTCGCCC CGGTTTTTCA
2221 CATGGGCAA TATTATACGC AAGGCGACAA GGTGCTGATG CCGCTGGCGA TTCAGGTTCA
2281 TCATGCCGTC TGTGATGGCT TCCATGTCGG CAGAATGCTT AATGAATTAC AACAGTACTG
2341 CGATGAGTGG CAGGGCGGGG CGTAATCTAG AGGATCCGGC TTACTAAAAG CCAGATAACA
2401 GTATGCGTAT TTGCGCGCTG ATTTTTCGCG TATAAGAATA TATACTGATA TGTATACCCG-

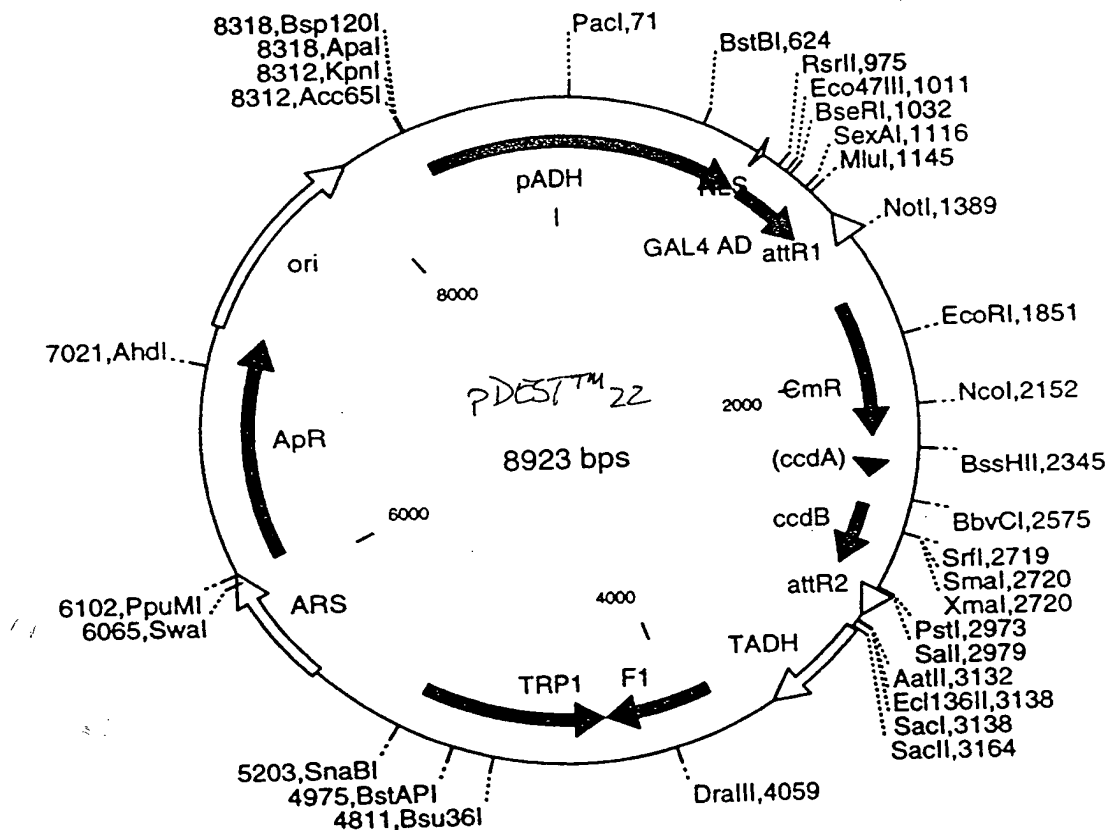
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FIGURE 413

5941	TGCTCCAGAT	TTGCCAAAGA	ATAAGGTTGA	CCCTATCGCC	ACTATCTTGT	CTGCTGCAAT
6001	GATGTTGAAA	TTGTCATTGA	ACTTGCCCTGA	AGAAGGTAAG	GCCATTGAAG	ATGCAGTTAA
6061	AAAGGTTTTG	GATGCAGGTA	TCAGAACTGG	TGATTTAGGT	GGTTCCAACA	GTACCACCGA
6121	AGTCGGTGAT	GCTGTGCGCCG	AAGAAGTTAA	GAAAATCCTT	GCTTAAAAAG	ATTCTCTTTT
6181	TTTATGATAT	TTGTACATAA	ACTTTATAAA	TGAAATTCAT	AATAGAAACG	ACACGAAATT
6241	ACAAAATGGA	ATATGTTTCAT	AGGGTAGACG	AAACTATATA	CGCAATCTAC	ATACATTTAT
6301	CAAGAAGGAG	AAAAAGGAGG	ATAGTAAAGG	AATACAGGTA	AGCAAATTGA	TACTAATGGC
6361	TCAACGTGAT	AAGGAAAAAG	AATTGCACCT	TAACATTAAT	ATTGACAAGG	AGGAGGGCAC
6421	CACACAAAAA	GTTAGGTGTA	ACAGAAAAATC	ATGAAACTAC	GACTTCTAAT	TTGATATTGG
6481	AGGATTTTTCT	CTAAAAAAAA	AAAAATACAA	CAATAAAAAA	ACACTCAATG	ACCTGACCAT
6541	TTGATGGAGT	TTAAGTCAAT	ACCTTCTTTGA	ACCATTTCCC	ATAATGGTGA	AAGTTCCCTC
6601	AAGAATTTTA	CTCTGTCAGA	AACGGCCTTA	CGACGTAGTC	GATATGGTGC	ACTCTCAGTA
6661	CAATCTGCTC	TGATGCCGCA	TAGTTAAGCC	AGCCCCGACA	CCCGCCAACA	CCCGCTGACG
6721	CGCCCTGACG	GGCTTGTCTG	CTCCCGGCAT	CCGCTTACAG	ACAAGCTGTG	ACCGTCTCCG
6781	GGAGCTGCAT	GTGTCAGAGG	TTTTCACCGT	CATCACCGAA	ACGCGCGAGA	CGAAAGGGCC
6841	TCGTGATACG	CCTATTTTTA	TAGGTTAATG	TCATGATAAT	AATGGTTTCT	TAGGACGGAT
6901	CGCTTGCCCTG	TAACCTTACAC	GCGCCTCGTA	TCTTTTAATG	ATGGAATAAT	TTGGGAATTT
6961	ACTCTGTGTT	TATTTATTTT	TATGTTTTGT	ATTTGGATTT	TAGAAAAGTAA	ATAAAGAAGG
7021	TAGAAGAGTT	ACGGAATGAA	GAAAAAATAA	TAAACAAAGG	TTTAAAAAAT	TTCAACAAAA
7081	AGCGTACTTT	ACATATATAT	TTATTAGACA	AGAAAAGCAG	ATTAAGATAGA	TATACATTCC
7141	ATTAACGATA	AGTAAAAATG	AAAATCACAG	GATTTTCGTG	TGTGGTCTTC	TACACAGACA
7201	AGATGAAACA	ATTCGGCATT	AATACCTGAG	AGCAGGAAGA	GCAAGATAAA	AGGTAGTATT
7261	TGTTGGCGAT	CCCCCTAGAG	TCTTTTACAT	CTTCGGAAAA	CAAAAACATAT	TTTTTCTTTA
7321	ATTTCTTTTT	TTACTTTCTA	TTTTTAATTT	ATATATTTAT	ATTAAAAAAT	TTAAATTATA
7381	ATTATTTTTTA	TAGCACGTGA	TGAAAAGGAC	CCAGGTGGCA	CTTTTCGGGG	AAATGTGCGC
7441	GGAACCCCTA	TTTGTTTATT	TTTCTAAATA	CATTCAAATA	TGTATCCGCT	CATGAGACAA
7501	TAACCCTGAT	AAATGCTTCA	ATAATCTGCA	GCTCTGGCCC	GTGTCTCAAA	ATCTCTGATG
7561	TTACATTGCA	CAAGATAAAA	ATATATCATC	ATGAACAATA	AAACTGTCTG	CTTACATAAA
7621	CAGTAATACA	AGGGGTGTTA	TGAGCCATAT	TCAACGGGAA	ACGTCTTGCT	GGAGGCCGCG
7681	ATTAAATTCC	AACATGGATG	CTGATTTATA	TGGGTATAAA	TGGGCTCGCG	ATAATGTCGG
7741	GCAATCAGGT	GCGACAATCT	TTCGATTGTA	TGGGAAGCCC	GATGCGCCAG	AGTTGTTTCT
7801	GAAACATGGA	AAAGGTAGCG	TTGCCAATGA	TGTTACAGAT	GAGATGGTCA	GACTAAACTG
7861	GCTGACGGAA	TTTATGCCTC	TCCCGACCAT	CAAGCATTTT	ATCCGTACTC	CTGATGATGC
7921	ATGGTTACTC	ACCATTGCGA	TCCGCGGGAA	AACAGCATTC	CAGGTATTAG	AGAAATATCC
7981	TGATTACAGT	GAAAAATATTG	TTGATGCGCT	GGCAGTGTTT	CTGCGCCGGT	TGCATTTCGAT
8041	TCCTGTTTGT	AATTGTCCTT	TTAACAGCGA	TCGCGTATTT	CGTCTCGCTC	AGGCGCAATC
8101	ACGAATGAAT	AACGGTTTGG	TTGATGCGAG	TGATTTTGAT	GACGAGCGTA	ATGGCTGGCC
8161	TGTTGAACAA	GTCTGAAAAG	AAATGCATAC	GCTTTTGCCA	TTCTCACCGG	ATTCAAGTCG
8221	CACTCATGGT	GATTTCTCAC	TTGATAACCT	TATTTTTGAC	GAGGGGAAAT	TAATAGGTTG
8281	TATTGATGTT	GGACGAGTCG	GAATCGCAGA	CCGATACCAG	GATCTTGCCA	TCCTATGGAA
8341	CTGCCTCGGT	GAGTTTTCTC	CTTCATTACA	GAAACGGCTT	TTTCAAAAAAT	ATGGTATTGA
8401	TAATCCTGAT	ATGAATAAAT	TGCAGTTTCA	TTTGATGCTC	GATGAGTTTT	TCTAATCAGA
8461	ATTGGTTAAT	TGGTTGTAAC	ACTGGCAGAG	CATTACGCTG	ACTTGACGGG	ACGGCGCATG
8521	ACCAAAATCC	CTTAACGTGA	GTTTTTCGTT	CAGTGAGCGT	CAGACCCCGT	AGAAAAGATC
8581	AAAGGATCTT	CTTGAGATCC	TTTTTTTCTG	CGCGTAATCT	GCTGCTTGCA	AACAAAAAAG
8641	CCACCGCTAC	CAGCGTGCGT	TTGTTTGCCG	GATCAAGAGC	TACCAACTCT	TTTCCGAGTA
8701	GTAACCTGGCT	TCAGCAGAGC	GCAGATACCA	AATACTGTCC	TTCTAGTGTA	TCTTCTAGTTA
8761	GGCCACCACT	TCAAGAACTC	TGTAGCACCG	CCTACATAAC	TCGCTCTGCT	AATCCTGTTA
8821	CCAGTGCGCTG	CTGCCAGTGG	CGATAAGTCG	TGTCTTACCG	GGTTGGACTC	AAGACGATAG
8881	TTACCGGATA	AGGCGCAGCG	GTCGGGCTGA	ACGGGGGGTT	CGTGCACACA	GCCCAGCTTG
8941	GAGCGAACGA	CCTACACCGA	ACTGAGATAC	CTACAGCGTG	AGCATTGAGA	AAGCGCCACG
9001	CTTCCCGAAG	GGAGAAAAGG	GGACAGGTAT	CCGGTAAGCG	GCAGGGTCGG	AACAGGAGAG
9061	CGCACGAGGG	AGCTTCCAGG	GGGGAACGCC	TGGTATCTTT	ATAGTCCTGT	CGGGTTTCGC
9121	CACCTCTGAC	TTGAGCGTCG	ATTTTTGTGA	TGCTCGTCAG	GGGGGCCGAG	CCTATGGAAA
9181	AACGCCACGA	ACGCGGCCCT	TTTACGGTTC	CTGGCCTTTT	GCTGGCCTTT	TGCTCACATG
9241	TTCTTTCTCTG	CGTTATCCCC	TGATTTCT			

FIGURE 4(D)

2-Hybrid Vector with Activation Domain

[illegible]

pDEST22 8923 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
904..1248	GAL4 AD
1388..1264	attR1
1638..2297	CmR
2417..2501	inactivated ccdA
2639..2944	ccdB
2985..3109	attR2
3831..4318	f1 (f1 intergenic region)
4334..5176	TRP1
6110..7194	ampR
8344..866	pADH (yeast ADH promoter)

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1  TTCATTTGGG TGTGCACTTT ATTATGTTAC AATATGGAAG GGAACTTTAC ACTTCTCCTA
61  TGCACATATA TTAATTAAAG TCCAATGCTA GTAGAGAAGG GGGGTAACAC CCCTCCGCGC
121 TCTTTTCCGA TTTTCTCTA AACCGTGGAA TATTTTCGGAT ATCCTTTTGT TGTTTCCGGG
181 TGTACAATAT GGACTTCCTC TTTTCTGGCA ACCAAACCCA TACATCGGGA TTCCTATAAT
241 ACCTTCGTTG GTCTCCCTAA CATGTAGGTG GCGGAGGGGA GATATACAAT AGAACAGATA
301 CCAGACAAGA CATAATGGGC TAAACAAGAC TACACCAATT ACACTGCCTC ATTGATGGTG
361 GTACATAACG AACTAATACT GTAGCCCTAG ACTTGATAGC CATCATCATA TCGAAGTTTC
421 ACTACCCTTT TTCCATTTGC CATCTATTGA AGTAATAATA GGCGCATGCA ACTTCTTTTC
481 TTTTCTCTCT TTTTCTCTCT CCCCCGTTGT TGTCTCACCA TATCCGCAAT GACAAAAAAA
541 ATGATGGAAG ACACATAAAG AAAAAATTAA CGACAAAGAC AGCACCAACA GATGTCGTTG
601 TTCCAGAGCT GATGAGGGGT ATCTTCGAAC ACACGAAACT TTTTCCTTCC TTCATTACAG
661 CACACTACTC TCTAATGAGC AACGGTATAC GGCCTTCCTT CCAGTTACTT GAATTTGAAA
721 TAAAAAAGT TTGCCGCTTT GCTATCAAGT ATAAATAGAC CTGCAATTAT TAATCTTTTG
781 TTTCTCTCGT ATTGTTCTCG TTCCCTTTCT TCCTTGTTTC TTTTCTGCA CAATATTTCA
841 AGCTATACCA AGCATACAAT CAACTCCAAG CTTATGCCCC AGAAGAAGCG GAAGGTCTCG
901 AGCGGCGCCA ATTTTAATCA AAGTGGGAAT ATTGCTGATA GCTCATTGTC CTTCACTTTC
961 ACTAACAGTA GCAACGGTCC GAACCTCATA ACAACTCAA CAAATTCTCA AGCGCTTTCA
1021 CAACCAATTG CCTCCTCTAA CGTTCATGAT AACTTCATGA ATAATGAAAT CACGGCTAGT
1081 AAAATTGATG ATGGTAATAA TTCAAAACCA CTGTCACCTG GTTGGACGGA CCAAACCTGCG
1141 TATAACGCGT TTGGAATCAC TACAGGGATG TTAAATACCA CTACAATGGA TGATGTATAT
1201 AACTATCTAT TCGATGATGA AGATACCCCA CCAAACCCAA AAAAAGAGGG TGGGTCGAAT
1261 CAAACAAGTT TGTACAAAAA AGCTGAACGA GAAACGTAAA ATGATATAAA TATCAATATA
1321 TTAAATTAGA TTTTGCATAA AAAACAGACT ACATAATACT GTAAAACACA ACATATCCAG
1381 TCACTATGGC GGCCGCTAAG TTGGCAGCAT CACCCGACGC ACTTGCGCC GAATAAATAC
1441 CTGTGACGGA AGATCACTTC GCAGAATAAA TAAATCCTGG TGTCCCTGTT GATACCGGGA
1501 AGCCCTGGG CAACTTTTGG CGAAAATGAG ACGTTGATCG GCACGTAAGA GGTTCCAACT
1561 TTCACCATAA TGAAATAAGA TCACTACCGG GCGTATTTT TGAGTTATCG AGATTTTCAG
1621 GAGCTAAGGA AGCTAAAATG GAGAAAAAAA TCACTGGATA TACCACCGTT GATATATCCC
1681 AATGGCATCG TAAAGAACAT TTTGAGGCAT TTCAGTCAGT TGCTCAATGT ACCTATAACC
1741 AGACCGTTCA GCTGGATATT ACGGCCTTTT TAAAGACCGT AAAGAAAAAT AAGCACAAGT
1801 TTTATCCGGC CTTTATTCAC ATTCTTGCCC GCCTGATGAA TGCTCATCCG GAATTCCGTA
1861 TGGCAATGAA AGACGGTGAG CTGGTGATAT GGGATAGTGT TCACCCTTGT TACACCGTTT
1921 TCCATGAGCA AACTGAAACG TTTTCATCGC TCTGGAGTGA ATACCACGAC GATTTCCGGC
1981 AGTTTCTACA CATATATTCG CAAGATGTGG CGTGTTACGG TGAAAACCTG GCCTATTTCC
2041 CTAAAGGGTT TATTGAGAAT ATGTTTTTTC TCTCAGCCAA TCCCTGGGTG AGTTTCACCA
2101 GTTTTGATTT AAACGTGGCC AATATGGACA ACTTCTTCGC CCCCCTTTTC ACCATGGGCA
2161 AATATTATAC GCAAGGCGAC AAGGTGCTGA TGCCGCTGGC GATTACGGTT CATCATGCCG
2221 TCTGTGATGG CTTCCATGTC GGCAGAATGC TTAATGAATT ACAACAGTAC TGCGATGAGT
2281 GGCAGGGCGG GGCCTAATCT AGAGGATCCG GCTTACTAAA AGCCAGATAA CAGTATGCGT
2341 ATTTGCGCGC TGATTTTTCG GGTATAAGAA TATATACTGA TATGTATACC CGAAGTATGT
2401 CAAAAAGAGG TGTGCTATGA AGCAGCGTAT TACAGTGACA GTTGACAGCG ACAGCTATCA
2461 GTTGCTCAAG GCATATATGA TGTCAATATC TCCGGTCTGG TAAGCACAAC CATGCAGAAT
2521 GAAGCCCGTC GTCTGCGTGC CGAACGCTGG AAAGCGGAAA ATCAGGAAGG GATGGCTGAG-

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FIGURE 42B

2581 GTCGCCCGGT TTATTGAAAT GAACGGCTCT TTTGCTGACG AGAACAGGGA CTGGTGAAAT
 2641 GCAGTTTAAAG GTTTACACCT ATAAAAGAGA GAGCCGTTAT CGTCTGTTTG TGGATGTACA
 2701 GAGTGATATT ATTGACACGC CCGGGCGACG GATGGTGATC CCCCTGGCCA GTGCACGTCT
 2761 GCTGTCAGAT AAAGTCTCCC GTGAACTTTA CCCGGTGGTG CATATCGGGG ATGAAAGCTG
 2821 GCGCATGATG ACCACCGATA TGGCCAGTGT GCCGGTCTCC GTTATCGGGG AAGAAGTGGC
 2881 TGATCTCAGC CACCGCGAAA ATGACATCAA AAACGCCATT AACCTGATGT TCTGGGGAAT
 2941 ATAAATGTCA GGCTCCCTTA TACACAGCCA GTCTGCAGGT CGACCATAGT GACTGGATAT
 3001 GTTGTGTTTT ACAGTATTAT GTAGTCTGTT TTTTATGCAA AATCTAATTT AATATATTGA
 3061 TATTTATATC ATTTTACGTT TCTCGTTCAG CTTTCTTGTA CAAAGTGGTT TGATGGCCGC
 3121 TAAGTAAGTA AGACGTCGAG CTCTAAGTAA GTAACGGCCG CCACCGCGGT GGAGCTTTGG
 3181 ACTTCTTCGC CAGAGGTTTG GTCAAGTCTC CAATCAAGGT TGTCGGCTTG TCTACCTTGC
 3241 CAGAAATTTA CGAAAAGATG GAAAAGGGTC AAATCGTTGG TAGATACGTT GTTGACACTT
 3301 CTAAATAGC GAATTTCTTA TGATTTATGA TTTTATTAT TAAATAAGTT ATAAAAAATA
 3361 TAAGTGTATA CAAATTTTAA AGTGACTCTT AGGTTTTTAAA ACGAAAATTC TTATTCTTGA
 3421 GTAACCTTTT CCTGTAGGTC AGGTTGCTTT CTCAGGTATA GCATGAGGTC GCTCTTATTG
 3481 ACCACACCTC TACCGGCATG CCGAGCAAAT GCCTGCAAAT CGCTCCCAT TTCACCCAAT
 3541 TGTAGATATG CTAACCTCCAG CAATGAGTTG ATGAATCTCG GTGTGTATTT TATGTCCTCA
 3601 GAGGACAATA CCTGTTGTAA TCGTTCTTCC ACACGGATCC CAATTCGCCC TATAGTGAGT
 3661 CGTATTACAA TTCACTGGCC GTCGTTTTAC AACGTCGTGA CTGGGAAAAC CCTGGCGTTA
 3721 CCCAACTTAA TCGCCTTGCA GCACATCCCC CTTTCGCCAG CTGGCGTAAT AGCGAAGAGG
 3781 CCCGCACCGA TCGCCCTTCC CAACAGTTGC GCAGCCTGAA TGGCGAATGG ACGCGCCCTG
 3841 TAGCGGCGCA TTAAGCGCGG CGGGTGTGGT GGTTACGCGC AGCGTGACCG CTACACTTGC
 3901 CAGCGCCCTA GCGCCCGCTC CTTTCGCTTT CTTCCCTTCC TTTCTCGCCA CGTTCCGCGG
 3961 CTTTCCCCGT CAAGCTCTAA ATCGGGGGCT CCCTTTAGGG TTCCGATTTA GTGCTTTACG
 4021 GCACCTCGAC CCCAAAAAAC TTGATTAGGG TGATGGTTCA CGTAGTGGGC CATCGCCCTG
 4081 ATAGACGGTT TTTTCGCCCT TGACGTTGGA GTCCACGTTT TTTAATAGTG GACTCTTGTT
 4141 CCAAACCTGA ACAACACTCA ACCCTATCTC GGTCTATTCT TTTGATTTAT AAGGGATTTT
 4201 GCCGATTTTC GCCTATTGGT TAAAAAATGA GCTGATTTAA CAAAAATTTA ACGCGAATTT
 4261 TAACAAAATA TTAACGTTTA CAATTTCTTG ATGCGGTATT TTCTCCTTAC GCATCTGTGC
 4321 GGTATTTTAC ACCGCAGGCA AGTGACAAA CAATACTTAA ATAAATACTA CTCAGTAATA
 4381 ACCTATTTCT TAGCATTTTT GACGAAATTT GCTATTTTGT TAGAGTCTTT TACACCATTT
 4441 GTCTCCACAC CTCCGCTTAC ATCAACACCA ATAACGCCAT TTAATCTAAG CGCATCACCA
 4501 ACATTTTCTG GCGTCAGTCC ACCAGCTAAC ATAAAATGTA AGCTTTTCGGG GCTCTCTTGC
 4561 CTTCCAACCC AGTCAGAAAT CGAGTTCCAA TCCAAAAGTT CACCTGTCCC ACCTGCTTCT
 4621 GAATCAAACA AGGGAATAAA CGAATGAGGT TTCTGTGAAG CTGCACTGAG TAGTATGTTG
 4681 CAGTCTTTTG GAAATACGAG TCTTTTAATA ACTGGCAAAC CGAGGAACTC TTGGTATTCT
 4741 TGCCACGACT CATCTCCATG CAGTTGGACG ATATCAATGC CGTAATCATT GACCAGGCC
 4801 AAAACATCCT CTTTAGGTTG ATTACGAAAC ACGCCAACCA AGTATTTCCG AGTGCCTGAA
 4861 CTATTTTTAT ATGCTTTTAC AAGACTGAA ATTTTCCTTG CAATAACCGG GTCAATTGTT
 4921 TCTTTTCTAT TGGGCACACA TATAATTACC AGCAAGTCAG CATCGGAATC TAGAGCACAT
 4981 TCTGCGGCCT CTGTGCTCTG CAAGCCGCAA ACTTTACCA ATGGACCAGA ACTACCTGTG
 5041 AAATTAATAA CAGACATACT CCAAGCTGCC TTTGTGTGCT TAATCACGTA TACTCACGTG
 5101 CTCAATAGTC ACCAATGCCC TCCCTCTTGG CCCTCTCCTT TTCTTTTTTC GACCGAATTA
 5161 ATTCTTAATC GGCAAAAAAA GAAAAGCTCC GGATCAAGAT TGTACGTAAG GTGACAAGCT
 5221 ATTTTTCAT AAAGAATATC TTCCACTACT GCCATCTGGC GTCATAACTG CAAAGTACAC
 5281 ATATATTACG ATGCTGTCTA TTAAATGCTT CCTATATTAT ATATATAGTA ATGTCGTTTA
 5341 TGGTGCACCTC TCAGTACAAT CTGCTCTGAT GCCGCATAGT TAAGCCAGCC CCGACACCCG
 5401 CCAACACCCG CTGACGCGCC CTGACGGGCT TGTCTGCTCC CGGCATCCGC TTACAGACAA
 5461 GCTGTGACCG TCTCCGGGAG CTGCATGTGT CAGAGGTTTT CACCGTCATC ACCGAAACGC
 5521 GCGAGACGAA AGGGCCTCGT GATACGCCTA TTTTATAGG TTAATGTCAT GATAATAATG
 5581 GTTCTTTAGG ACGGATCGCT TGCCTGTAAC TTACACGCGC CTCGTATCTT TTAATGATGG
 5641 AATAATTTGG GAATTTACTC TGTGTTTATT TATTTTATG TTTTGTATTT GGATTTTAGA
 5701 AAGTAAATAA AGAAGGTAGA AGAGTTACGG AATGAAGAAA AAAAAATAAA CAAAGGTTTA
 5761 AAAAATTTCA ACAAAGCG TACTTTACAT ATATATTTAT TAGACAAGAA AAGCAGATTA
 5821 AATAGATATA CATTCGATTA ACGATAAGTA AAATGTAAAA TCACAGGATT TTCGTGTGTG
 5881 GTCTTCTACA CAGACAAGAT GAAACAATTC GGCATTAATA CCTGAGAGCA GGAAGAGCAA
 5941 GATAAAAGGT AGTATTTGTT GGCGATCCCC CTAGAGTCTT TTACATCTTC GGAAAACAAA
 6001 AACTATTTTT TCTTTAATTT CTTTTTTTAC TTTCTATTTT TAATTTATAT ATTTATATTA-

FIGURE 42C

6061	AAAAATTTAA	ATTATAATTA	TTTTTATAGC	ACGTGATGAA	AAGGACCCAG	GTGGCACTTT
6121	TCGGGGAAAT	GTGCGCGGAA	CCCCTATTTC	TTTATTTTTC	TAAATACATT	CAAATATGTA
6181	TCCGCTCATG	AGACAATAAC	CCTGATAAAT	GCTTCAATAA	TATTGAAAAA	GGAAGAGTAT
6241	GAGTATTCAA	CATTTCCGTG	TCGCCCTTAT	TCCCTTTTTT	GCGGCATTTT	GCCTTCCTGT
6301	TTTTGCTCAC	CCAGAAACGC	TGGTGAAAAGT	AAAAGATGCT	GAAGATCAGT	TGGGTGCACG
6361	AGTGGGTAC	ATCGAACTGG	ATCTCAACAG	CGGTAAGATC	CTTGAGAGTT	TTCGCCCCGA
6421	AGAACGTTTT	CCAATGATGA	GCACTTTTAA	AGTTCTGCTA	TGTGGCGCGG	TATTATCCCG
6481	TATTGACGCC	GGGCAAGAGC	AACTCGGTGC	CCGCATACAC	TATTCTCAGA	ATGACTTGGT
6541	TGAGTACTCA	CCAGTCACAG	AAAAGCATCT	TACGGATGGC	ATGACAGTAA	GAGAATTATG
6601	CAGTGCTGCC	ATAACCATGA	GTGATAACAC	TGCGGCCAAC	TTACTTCTGA	CAACGATCGG
6661	AGGACCGAAG	GAGCTAACCG	CTTTTTTTTCA	CAACATGGGG	GATCATGTAA	CTCGCCTTGA
6721	TCGTTGGGAA	CCGGAGCTGA	ATGAAGCCAT	ACCAAACGAC	GAGCGTGACA	CCACGATGCC
6781	TGTAGCAATG	GCAACAACGT	TGCGCAAAC	ATTAAC	TGCG	TTCTAGCTTC
6841	CCGGCAACAA	TTAATAGACT	GGATGGAGGC	GGATAAAGTT	GCAGGACCAC	TTCTGCGCTC
6901	GGCCCTTCCG	GCTGGCTGGT	TTATTGCTGA	TAAATCTGGA	GCCGGTGAGC	GTGGGTCTCG
6961	CGGTATCATT	GCAGCACTGG	GGCCAGATGG	TAAGCCCTCC	CGTATCGTAG	TTATCTACAC
7021	GACGGGCAGT	CAGGCAACTA	TGGATGAACG	AAATAGACAG	ATCGCTGAGA	TAGGTGCCTC
7081	ACTGATTAA	CATTGGTAA	TGTCAGACCA	AGTTTACTCA	TATATACTTT	AGATTGATTT
7141	AAAACCTTCAT	TTTTAATTTA	AAAGGATCTA	GGTGAAGATC	CTTTTTGATA	ATCTCATGAC
7201	CAAAATCCCT	TAACGTGAGT	TTTCGTTCCA	CTGAGCGTCA	GACCCCGTAG	AAAAGATCAA
7261	AGGATCTTCT	TGAGATCCTT	TTTTTCTGCG	CGTAATCTGC	TGCTTGCAAA	CAAAAAAACC
7321	ACCGCTACCA	GCGGTGGTTT	GTTTGCCGGA	TCAAGAGCTA	CCAACTCTTT	TTCCGAAGGT
7381	AACTGGCTTC	AGCAGAGCGC	AGATACCAAA	TACTGTCCCT	CTAGTGTAGC	CGTAGTTAGG
7441	CCACCACTTC	AAGAACTCTG	TAGCACCGCC	TACATACCTC	GCTCTGCTAA	TCCTGTTACC
7501	AGTGGCTGCT	GCCAGTGGCG	ATAAGTCGTG	TCTTACCGGG	TTGGACTCAA	GACGATAGTT
7561	ACCGGATAAG	GCGCAGCGGT	CGGGCTGAAC	GGGGGGTTCG	TGCACACAGC	CCAGCTTGGA
7621	GCGAACGACC	TACACCGAAC	TGAGATACCT	ACAGCGTGAG	CATTGAGAAA	GCGCCACGCT
7681	TCCCGAAGGG	AGAAAGGCGG	ACAGGTATCC	GGTAAGCGGC	AGGGTCGGAA	CAGGAGAGCG
7741	CACGAGGGAG	CTTCCAGGGG	GGAAACGCTG	GTATCTTTAT	AGTCCTGTG	GGTTTCGCCA
7801	CCTCTGACTT	GAGCGTCGAT	TTTTGTGATG	CTCGTCAGGG	GGGCCGAGCC	TATGGA AAAA
7861	CGCCAGCAAC	GCGGCCTTTT	TACGGTTCCT	GGCCTTTTGC	TGGCCTTTTG	CTCACATGTT
7921	CTTTCCTGCG	TTATCCCCTG	ATTCTGTGGA	TAACCGTATT	ACCGCCTTTG	AGTGAGCTGA
7981	TACCGCTCGC	CGCAGCCGAA	CGACCGAGCG	CAGCGAGTCA	GTGAGCGAGG	AAGCGGAAGA
8041	GCGCCCAATA	CGCAAACCGC	CTCTCCCCGC	GCGTTGGCCG	ATTCAATTAAT	GCAGCTGGCA
8101	CGACAGGTTT	CCCGACTGGA	AAGCGGGCAG	TGAGCGCAAC	GCAATTAATG	TGAGTTACCT
8161	CACTCATTAG	GCACCCCAGG	CTTTTACACTT	TATGCTTCCG	GCTCCTATGT	TGTGTGGAAT
8221	TGTGAGCGGA	TAACAATTTT	ACACAGGAAA	CAGCTATGAC	CATGATTACG	CCAAGCTCGG
8281	AATTAACCTT	CACTAAAGGG	AACAAAAGCT	GGGTACCGGG	CCCCCCTCG	AGATCCGGGA
8341	TCGAAGAAAT	GATGGTAAAT	GAAATAGGAA	ATCAAGGAGC	ATGAAGGCAA	AAGACAATA
8401	TAAGGGTCGA	ACGAAAAATA	AAGTGAAAAG	TGTTGATATG	ATGATATTTG	CTTTCGCGCG
8461	CCGAAAAAAC	GAGTTTACGC	AATTGCACAA	TCATGCTGAC	TCTGTGGCGG	ACCCGCGCTC
8521	TTGCCGGCCC	GGCGATAACG	CTGGGCGTGA	GGCTGTGCCC	GGCGGAGTTT	TTTGCGCCTG
8581	CATTTTCCAA	GGTTTACCCT	GCGCTAAGGG	GCGAGATTGG	AGAAGCAATA	AGAATGCCGG
8641	TTGGGGTTGC	GATGATGACG	ACCACGACAA	CTGGTGTTCAT	TATTTAAGTT	GCCGAAAGAA
8701	CCTGAGTGCA	TTTGCAACAT	GAGTATACTA	GAAGAATGAG	CCAAGACTTG	CGAGACGCGA
8761	CTTTGCCGGT	GGTGCGAACA	ATAGAGCGAC	CATGACCTTG	AAGGTGAGAC	GCGCATAACC
8821	GCTAGAGTAC	TTTGAAGAGG	AAACAGCAAT	AGGGTTGCTA	CCAGTATAAA	TAGACAGGTA
8881	CATACAACAC	TGGAAATGGT	TGTCTGTTTG	AGTACGCTTT	CAA	

FIGURE 4 2d

PDEST23

205 atc cgc cga aat taa tac gac tca cta tag gga gat cac aac ggt ttc cct
 tag ggc gct tta att atg ctg agt gat atc cct ctg gtg ttg cca aag gga

256 cta gat cac aag ttt gta caa aaa agc tga acg aga aac gta aaa tga tat //
 gat cta gtg ttc aaa cat gtt ttt tgc act tgc tct ttg cat ttt act ata //

11 ————— $C_m R$ ————— $ccd R$ ————— 11

1888 ttt tta tgc aaa atc taa ttt aat ata ttg ata ttt ata tca ttt tac gtt
 aaa aat acg ttt tag att aaa tta tat aac tat aaa tat agt aaa atg caa
 1939 // attR2 A F L Y K V Y I M S Y Y H H
 tct cgt tca gct ttc ttg tac aaa gtg gtg' att atg tgc tac tac cat cac
 aga gca agt cga aag aac atg' ttt cac cac taa tac agc atg atg gta gtg
 // H H H H L D EV Q term His6
 1990 cat cac cat cac ctc gat gat caa taa cta gca taa ccc ctt ggg gcc tct
 gta gtg gta gtg ggc cta ctc gtt att gat cgt att ggg gaa ccc cgg aga

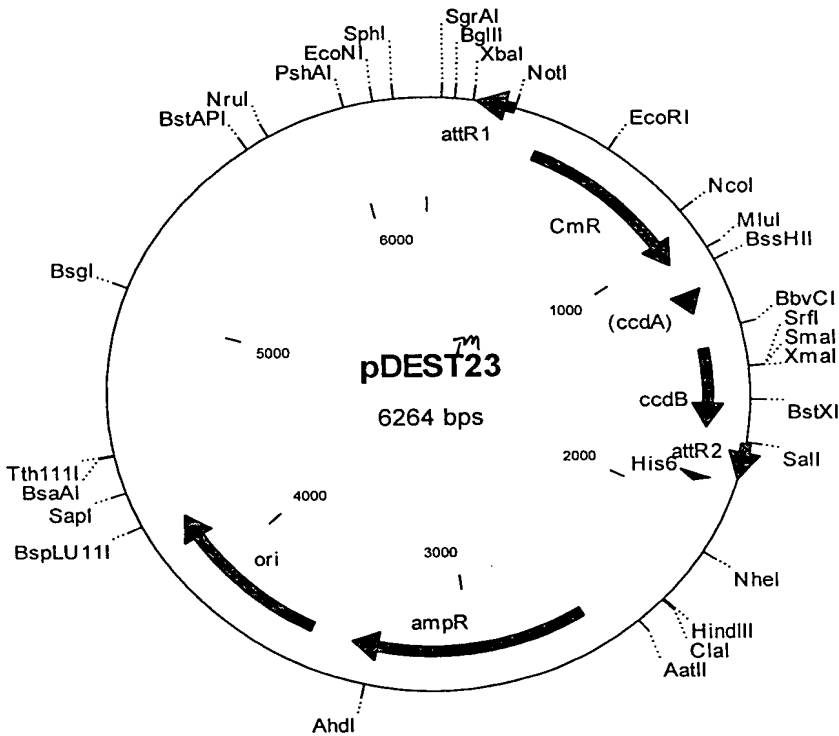


FIGURE 43A

[illegible]

pDEST23 6264 bp

Location (Base Nos.)	Gene Encoded
285..161	attR1
394..1053	CmR
1173..1257	inactivated ccdA
1395..1700	ccdB
1741..1865	attR2
1883..1911	his6
2574..3434	ampR
3583..4222	ori

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1 TCTTCCCAT CGGTGATGTC GCGATATAG GCGCCAGCAA CCGCACCTGT GGCGCCGGTG
61 ATGCCGCGCA CGATGCGTCC GCGTAGAGG ATCGAGATCT CGATCCCGCG AAATTAATAC
121 GACTCACTAT AGGGAGACCA CAACGGTTTC CCTCTAGATC ACAAGTTTGT ACAAAAAAGC
181 TGAACGAGAA ACGTAAATG ATATAAATAT CAATATATTA AATTAGATTT TGCATAAAAA
241 ACAGACTACA TAATACTGTA AAACACAACA TATCCAGTCA CTATGGCGGC CGCATTAGGC
301 ACCCCAGGCT TTACACTTTA TGCTTCCGGC TCGTATAATG TGTGGATTTT GAGTTAGGAT
361 CCGGCGAGAT TTTCAGGAGC TAAGGAAGCT AAAATGGAGA AAAAAATCAC TGGATATACC
421 ACCGTTGATA TATCCCAATG GCATCGTAAA GAACATTTTG AGGCATTTCA GTCAGTTGCT
481 CAATGTACCT ATAACCAGAC CGTTCAGCTG GATATTACGG CCTTTTAAAG GACCGTAAAG
541 AAAAAAAGC ACAAGTTTTA TCCGGCCTTT ATTACATTC TTGCCCCCCT GATGAATGCT
601 CATCCGGAAT TCCGTATGGC AATGAAAGAC GGTGAGCTGG TGATATGGGA TAGTGTTTAC
661 CCTTGTTACA CCGTTTTCCTA TGAGCAAAC GAAACGTTTT CATCGCTCTG GAGTGAATAC
721 CACGACGATT TCCGGCAGTT TCTACACATA TATTCGCAAG ATGTGGCGTG TTACGGTGAA
781 AACCTGGCCT ATTTCCCTAA AGGGTTTATT GAGAATATGT TTTTCGTCTC AGCCAATCCC
841 TGGGTGAGTT TCACCAGTTT TGATTTAAAC GTGGCCAATA TGGACAACTT CTTCGCCCCC
901 GTTTTCACCA TGGGCAAATA TTATACGCAA GGCGACAAGG TGCTGATGCC GCTGGCGATT
961 CAGGTTTCATC ATGCCGTCTG TGATGGCTTC CATGTCGGCA GAATGCTTAA TGAATTACAA
1021 CAGTACTGCG ATGAGTGGCA GGGCGGGGCG TAAACGCGTG GATCCGGCTT ACTAAAAGCC
1081 AGATAACAGT ATGCGTATTT GCGCGCTGAT TTTTGCGGTA TAAGAATATA TACTGATATG
1141 TATACCCGAA GTATGTCAA AAGAGGTGTG CTATGAAGCA GCGTATTACA GTGACAGTTG
1201 ACAGCGACAG CTATCAGTTG CTCAAGGCAT ATATGATGTC AATATCTCCG GTCTGGTAAG
1261 CACAACCATG CAGAATGAAG CCCGTCGTCT GCGTGCCGAA CGCTGGAAAG CGGAAAATCA
1321 GGAAGGGATG GCTGAGGTCG CCCGTTTAT TGAAATGAAC GGCTCTTTTG CTGACGAGAA
1381 CAGGGACTGG TGAAATGCAG TTTAAGGTTT ACACCTATA AAGAGAGAGC CGTTATCGTC
1441 TGTTTGTTGA TGTACAGAT GATATTATTG ACACGCCCCG GCGACGGATG GTGATCCCCC
1501 TGGCCAGTGC ACGTCTGCTG TCAGATAAAG TCTCCCGTGA ACTTTACCCG GTGGTGCATA
1561 TCGGGGATGA AAGCTGGCGC ATGATGACCA CCGATATGGC CAGTGTGCCG GTCTCCGTTA
1621 TCGGGGAAGA AGTGGCTGAT CTCAGCCACC GCGAAAATGA CATCAAAAAC GCCATTAACC
1681 TGATGTTCTG GGGAATATAA ATGTCAGGCT CCCTTATACA CAGCCAGTCT GCAGGTCGAC
1741 CATAGTGA CTGATATGTTG TGTTTTACAG TATTATGTAG TCTGTTTTTT ATGCAAAATC
1801 TAATTTAATA TATTGATATT TATATCATTT TACGTTTCTC GTTCAGCTTT CTTGTACAAA
1861 GTGGTGATTA TGTCGTACTA CCATCACCAT CACCATCACC TCGATGAGCA ATAAGTAGCA
1921 TAACCCCTTG GGGCCTCTAA ACGGGTCTTG AGGGGTTTTT TGCTGAAAGG AGGAACATA
1981 TCCGGATATC CACAGGACGG GTGTGGTCGC CATGATCGCG TAGTCGATAG TGGCTCCAAG
2041 TAGCGAAGCG AGCAGGACTG GCGGCGGCC AAAGCGGTCG GACAGTGCTC CGAGAACGGG
2101 TGCGCATAGA AATTGCATCA ACGCATATAG CGCTAGCAGC ACGCCATAGT GACTGGCGAT
2161 GCTGTGCGAA TGGACGATAT CCCGCAAGAG GCCCGGCAGT ACCGGCATAA CCAAGCCTAT
2221 GCCTACAGCA TCCAGGGTGA CGGTGCCGAG GATGACGATG AGCGCATTTG TAGATTTTAT
2281 ACACGGTGCC TGACTGCGTT AGCAATTTAA CTGTGATAAA CTACCCGATT AAAGCTTATC
2341 GATTAAGAC TGTCAAACAT GAGAATTTT GAAGACGAAA GGGCCTCGTG ATACGCTTAT
2401 TTTTATAGGT TAATGTCATG ATAATAATGG TTTCTTAGAC GTCAGGTGGC ACTTTTCGGG
2461 GAAATGTGCG CGGAACCCCT ATTTGTTTTAT TTTTCTAAAT ACATTCAAAT ATGTATCCGC
2521 TCATGAGACA ATAACCCTGA TAAATGCTTC AATAATATTG AAAAAGGAAG AGTATGAGTA
2581 TTCAACATTT CCGTGTGCGC CTTATTCCTT TTTTTCGGC ATTTTGCCTT CCTGTTTTTG
2641 CTCACCCAGA AACGCTGGTG AAAGTAAAAG ATGCTGAAGA TCAGTTGGGT GCACGAGTGG

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FIGURE 438

2701 GTTACATCGA ACTGGATCTC AACAGCGGTA AGATCCTTGA GAGTTTTTCGC CCCGAAGAAC
2761 GTTTTCCAAT GATGAGCACT TTTAAAGTTC TGCTATGTGG CGCGGTATTA TCCCGTGTGG
2821 ACGCCGGGCA AGAGCAACTC GGTCGCCGCA TACACTATTC TCAGAATGAC TTGGTTGAGT
2881 ACTCACCAGT CACAGAAAAG CATCTTACGG ATGGCATGAC AGTAAGAGAA TTATGCAGTG
2941 CTGCCATAAC CATGAGTGAT AACACTGCGG CCAACTTACT TCTGACAACG ATCGGAGGAC
3001 CGAAGGAGCT AACCGCTTTT TTGCACAACA TGGGGGATCA TGTAACTCGC CTTGATCGTT
3061 GGGAAACCGA GCTGAATGAA GCCATACCAA ACGACGAGCG TGACACCACG ATGCCTGCAG
3121 CAATGGCAAC AACGTTGCGC AAACCTATTAA CTGGCGAACT ACTTACTCTA GCTTCCCGGC
3181 AACAATTAAT AGACTGGATG GAGGCGGATA AAGTTGCAGG ACCACTTCTG CGCTCGGCCC
3241 TTCCGGCTGG CTGGTTTATT GCTGATAAAT CTGGAGCCGG TGAGCGTGGG TCTCGCGGTA
3301 TCATTGCAGC ACTGGGGCCA GATGGTAAGC CCTCCCGTAT CGTAGTTATC TACACGACGG
3361 GGAGTCAGGC AACTATGGAT GAACGAAATA GACAGATCGC TGAGATAGGT GCCTCACTGA
3421 TTAAGCATTG GTAACGTGCA GACCAAGTTT ACTCATATAT ACTTTAGATT GATTTAAAAC
3481 TTCATTTTTA ATTTAAAGG ATCTAGGTGA AGATCCTTTT TGATAATCTC ATGACCAAAA
3541 TCCCTTAACG TGAGTTTTTC TTCCACTGAG CGTCAGACCC CGTAGAAAAG ATCAAAGGAT
3601 CTTCTTGAGA TCCTTTTTTT CTGCGCGTAA TCTGCTGCTT GCAAACAAAA AAACCACCGC
3661 TACCAGCGGT GGTTTGTGTT CCGGATCAAG AGCTACCAAC TCTTTTCCG AAGGTAACGT
3721 GCTTCAGCAG AGCGCAGATA CCAAATACTG TCCTTCTAGT GTAGCCGTAG TTAGGCCACC
3781 ACTTCAAGAA CTCTGTAGCA CCGCTACAT ACCTCGCTCT GCTAATCCTG TTACCAGTGG
3841 CTGCTGCCAG TGGCGATAAG TCGTGTCTTA CCGGGTTGGA CTCAAGACGA TAGTTACCGG
3901 ATAAGCGCA GCGGTCGGGC TGAACGGGGG GTTCGTGCAC ACAGCCCAGC TTGGAGCGAA
3961 CGACCTACAC CGAACTGAGA TACCTACAGC GTGAGCTATG AGAAAGCGCC ACGCTTCCCG
4021 AAGGGAGAAA GCGGACAGG TATCCGGTAA GCGGCAGGGT CGGAACAGGA GAGCGCACGA
4081 GGGAGCTTCC AGGGGGAAAC GCCTGGTATC TTTATAGTCC TGTCGGGTTT CGCCACCTCT
4141 GACTTGAGCG TCGATTTTTG TGATGCTCGT CAGGGGGGCG GAGCCTATGG AAAAACGCCA
4201 GCAACGCGGC CTTTTTACGG TTCCTGGCCT TTTGCTGGCC TTTTGCTCAC ATGTTCTTTC
4261 CTGCGTTATC CCCTGATTCT GTGGATAACC GTATTACCGC CTTTGAGTGA GCTGATACCG
4321 CTCGCCGAG CCGAACGACC GAGCGCAGCG AGTCAGTGAG CGAGGAAGCG GAAGAGCGCC
4381 TGATGCGGTA TTTTCTCCTT ACGCATCTGT GCGGTATTTT ACACCGCATA TATGGTGCAC
4441 TCTCAGTACA ATCTGCTCTG ATGCCGCATA GTTAAGCCAG TATACACTCC GCTATCGCTA
4501 CGTGA CTGGG TCATGGCTGC GCCCCGACAC CCGCCAACAC CCGCTGACGC GCCCTGACCG
4561 GCTTGTCTGC TCCCGGCATC CGCTTACAGA CAAGCTGTGA CCGTCTCCGG GAGCTGCATG
4621 TGTCAGAGGT TTTACCGTC ATCACGAAA CGCGCGAGGC AGCTGCGGTA AAGCTCATCA
4681 GCGTGGTCTG GAAGCGATT ACAGATGTCT CCCTGTTTAT CCGCGTCCAG CTCGTTGAGT
4741 TTCTCCAGAA GCGTTAATGT CTGGCTTCTG ATAAAGCGGG CCATGTTAAG GCGGGTTTTT
4801 TCCTGTTTGG TCACTGATGC CTCCGTGTAA GGGGGATTTT TGTTTCATGGG GGTAATGATA
4861 CCGATGAAAC GAGAGAGGAT GCTCACGATA CCGGTACTG ATGATGAACA TGCCCGGTTA
4921 CTGGAACGTT GTGAGGGTAA ACAACTGGCG GTATGGATGC GCGGGGACCA GAGAAAAATC
4981 ACTCAGGGTC AATGCCAGCG CTTCTGTTAAT ACAGATGTAG GTGTTCCACA GGGTAGCCAG
5041 CAGCATCCTG CGATGCAGAT CCGGAACATA ATGGTGCAGG GCGCTGACTT CCGCGTTTCC
5101 AGACTTTACG AAACACGGAA ACCGAAGACC ATTCATGTTG TTGCTCAGGT CGCAGACGTT
5161 TTGCAGCAGC AGTCGCTTCA CGTTCGCTCG CGTATCGGTG ATTCATTCTG CTAACCAGTA
5221 AGGCAACCCC GCCAGCCTAG CCGGGTCTCT AACGACAGGA GCACGATCAT GCGCACCCGT
5281 GGCCAGGACC CAACGCTGCC CGAGATGCGC CGCGTGCGGC TGCTGGAGAT GCGGACGCG
5341 ATGGATATGT TCTGCCAAGG GTTGGTTTGC GCATTACAG TTCTCCGCAA GAATTGATTG
5401 GCTCCAATTC TTGGAGTGGT GAATCCGTTA GCGAGGTGCC GCCGCTTCC ATTCAGGTGCG
5461 AGGTGGCCCG GCTCCATGCA CCGCAGCGA ACGCGGGGAG GCAGACAAGG TATAGGGCGG
5521 CGCCTACAAT CCATGCCAAC CCGTTCCATG TGCTCGCCGA GGCGGCATAA ATCGCCGTGA
5581 CGATCAGCGG TCCAGTGATC GAAGTTAGGC TGGTAAGAGC CGCGAGCGAT CCTTGAAGCT
5641 GTCCCTGATG GTCGTCATCT ACCTGCCTGG ACAGCATGGC CTGCAACGCG GGCATCCCGA
5701 TGCCGCCGGA AGCGAGAAGA ATCATAATGG GGAAGGCCAT CCAGCCTCGC GTCGCGAACG
5761 CCAGCAAGAC GTAGCCCAGC GCGTCGGCCG CCATGCCGGC GATAATGGCC TGCTTCTCGC
5821 CGAAACGTTT GGTGGCGGGA CCAGTGACGA AGGCTTGAGC GAGGGCGTGC AAGATTCCGA
5881 ATACCGCAAG CGACAGGCCG ATCATCGTCG CGCTCCAGCG AAAGCGGTCC TCGCCGAAAA
5941 TGACCCAGAG CGCTGCCGGC ACCTGTCCTA CGAGTTGCAT GATAAAGAAG ACAGTCATAA
6001 GTGCGGCGAC GATAGTCATG CCCC CGCGCC ACCGGAAGGA GCTGACTGGG TTGAAGGCTC
6061 TCAAGGCGAT CGGTCGATCG ACGCTCTCCC TTATGCGACT CCTGCATTAG GAAGCAGCCC
6121 AGTAGTAGGT TGAGGCCGTT GAGCACCGCC GCCCAAGGA ATGGTGCATG CAAGGAGATG

Figure 43C

6181 GCGCCCAACA GTCCCCCGGC CACGGGGCCT GCCACCATAC CCACGCCGAA ACAAGCGCTC
6241 ATGAGCCCGA AGTGGCGAGC CCGA

FIGURE 43D

[illegible]

FIGURE 44A

pDEST24 6961 bp

<u>Location (Base Nos.)</u>		<u>Gene Encoded</u>
195..71		attR1
304..963		CmR
1083..1167		inactivated ccdA
1305..1610		ccdB
1651..1775		attR2
1783..2451		GST
3181..4041		ampR
4190..4829		ori

1	ATCGAGATCT	CGATCCCGCG	AAATTAATAC	GACTCACTAT	AGGGAGACCA	CAACGGTTTC
61	CCTCTAGATC	ACAAGTTTGT	ACAAAAAAGC	TGAACGAGAA	ACGTAAAATG	ATATAAATAT
121	CAATATATTA	AATTAGATTT	TGCATAAAAA	ACAGACTACA	TAATACTGTA	AAACACAACA
181	TATCCAGTCA	CTATGGCGGC	CGCATTAGGC	ACCCCAGGCT	TTACTACTTTA	TGCTTCCGGC
241	TCGTATAATG	TGTGGATTTT	GAGTTAGGAT	CCGGCGAGAT	TTTCAGGAGC	TAAGGAAGCT
301	AAAATGGAGA	AAAAATCAC	TGGATATACC	ACCGTTGATA	TATCCCAATG	GCATCGTAAA
361	GAACATTTTG	AGGCATTTCA	GTCAGTTGCT	CAATGTACCT	ATAACCAGAC	CGTTCAGCTG
421	GATATTACGG	CCTTTTTTAA	GACCGTAAAG	AAAAATAAGC	ACAAGTTTTA	TCCGGCCTTT
481	ATTCACATTC	TTGCCCGCCT	GATGAATGCT	CATCCGGAAT	TCCGTATGGC	AATGAAAGAC
541	GGTGAGCTGG	TGATATGGGA	TAGTGTTCAC	CCTTGTTCAC	CCGTTTTCCA	TGAGCAAAC
601	GAAACGTTTT	CATCGCTCTG	GAGTGAATAC	CACGACGATT	TCCGGCAGTT	TCTACACATA
661	TATTCGCAAG	ATGTGGCGTG	TTACGGTGAA	AACCTGGCCT	ATTTCCCTAA	AGGGTTTATT
721	GAGAATATGT	TTTTCGTCTC	AGCCAATCCC	TGGGTGAGTT	TCACCAGTTT	TGATTTAAAC
781	GTGGCCAATA	TGGACAACCT	CTTCGCCCCC	GTTTTTCACCA	TGGGCAAATA	TTATACGCCAA
841	GGCGACAAGG	TGCTGATGCC	GCTGGCGATT	CAGGTTTCATC	ATGCCGTCTG	TGATGGCTTC
901	CATGTCGGCA	GAATGCTTAA	TGAATTACAA	CAGTACTGCG	ATGAGTGGCA	GGGCGGGGCG
961	TAAACGCGTG	GATCCGCTT	ACTAAAAGCC	AGATAACAGT	ATGCGTATTT	GCGCGCTGAT
1021	TTTTGCGGTA	TAAGAAATATA	TACTGATATG	TATACCCGAA	GTATGTCAA	AAGAGGTGTG
1081	CTATGAAGCA	GCGTATTACA	GTGACAGTTG	ACAGCGACAG	CTATCAGTTG	CTCAAGGCAT
1141	ATATGATGTC	AATATCTCCG	GTCTGGTAAG	CACAACCATG	CAGAATGAAG	CCCGTCGTCT
1201	GCGTGCCGAA	CGCTGGAAAG	CGGAAAATCA	GGAAGGGATG	GCTGAGGTCG	CCCGGTTTTAT
1261	TGAAATGAAC	GGCTCTTTTG	CTGACGAGAA	CAGGGACTGG	TGAAATGCAG	TTTAAGGTTT
1321	ACACCTATAA	AAGAGAGAGC	CGTTATCGTC	TGTTTGTTGA	TGTACAGAGT	GATATTATTG
1381	ACACGCCCGG	GCGACGGATG	GTGATCCCCC	TGGCCAGTGC	ACGTCTGCTG	TCAGATAAAG
1441	TCTCCCGTGA	ACTTTACCCG	GTGGTGATA	TCGGGGATGA	AAGCTGGCGC	ATGATGACCA
1501	CCGATATGGC	CAGTGTGCCG	GTCTCCGTTA	TCGGGGAAGA	AGTGGCTGAT	CTCAGCCACC
1561	GCGAAAATGA	CATCAAAAAC	GCCATTAACC	TGATGTTCTG	GGGAATATAA	ATGTCAGGCT
1621	CCCTTATACA	CAGCCAGTCT	GCAGGTCGAC	CATAGTGACT	GGATATGTTG	TGTTTTACAG
1681	TATTATGTAG	TCTGTTTTTT	ATGCAAAATC	TAATTTAATA	TATTGATATT	TATATCATTT
1741	TACGTTTCTC	GTTTCAGCTT	CTTGTAACAA	GTGGTGATTA	TGTCCCTAT	ACTAGGTTAT
1801	TGGAAAATTA	AGGGCCTTGT	GCAACCCACT	CGACTTCTTT	TGGAATATCT	TGAAGAAAAA
1861	TATGAAGAGC	ATTTGTATGA	GCGCGATGAA	GGTGATAAAT	GGCGAAACAA	AAAGTTTGAA
1921	TTGGGTTTGG	AGTTTCCCAA	TCTTCCTTAT	TATATTGATG	GTGATGTTAA	ATTAACACAG
1981	TCTATGGCCA	TCATACGTTA	TATAGCTGAC	AAGCACAACA	TGTTGGGTGG	TTGTCCAAAA
2041	GAGCGTGCG	AGATTTCAT	GCTTGAAGGA	GCGGTTTTTG	ATATTAGATA	CGGTGTTTCG
2101	AGAATTGCAT	ATAGTAAAGA	CTTTGAAACT	CTCAAAGTTG	ATTTTCTTAG	CAAGCTACCT
2161	GAAATGCTGA	AAATGTTTCA	AGATCGTTTA	TGTCATAAAA	CATATTTAAA	TGGTGATCAT
2221	GTAACCCATC	CTGACTTCAT	GTTGTATGAC	GCTCTTGATG	TTGTTTTATA	CATGGACCCA
2281	ATGTGCCTGG	ATGCGTTCCC	AAAATTAGTT	TGTTTTAAAA	AACGTATTGA	AGCTATCCCA
2341	CAAATTGATA	AGTACTTGAA	ATCCAGCAAG	TATATAGCAT	GGCCTTTGCA	GGGCTGGCAA
2401	GCCACGTTTG	GTGGTGGCGA	CCATCCTCCA	AAATCGGATC	TGGTTCCGCG	TCCATGGGGA
2461	TCCGGCTGCT	AACAAAGCCC	GAAAGGAAGC	TGAGTTGGCT	GCTGCCACCG	CTGAGCAATA
2521	ACTAGCATAA	CCCCTTGGGG	CCTCTAAACG	GGTCTTGAGG	GGTTTTTTCG	TGAAGAGAGG
2581	AACTATATCC	GGATATCCAC	AGGACGGGTG	TGGTCGCCAT	GATCGCGTAG	TCGATAGTGG
2641	CTCCAAGTAG	CGAAGCGAGC	AGGACTGGGC	GGCGGCCAAA	GCGGTCCGAC	AGTGCTCCGA-

FIGURE 44B

2701 GAACGGGTGC GCATAGAAAT TGCATCAACG CATATAGCGC TAGCAGCACG CCATAGTGAC
2761 TGGCGATGCT GTCGGAATGG ACGATATCCC GCAAGAGGCC CGGCAGTACC GGCATAACCA
2821 AGCCTATGCC TACAGCATCC AGGGTGACGG TGCCGAGGAT GACGATGAGC GCATTGTTAG
2881 ATTTTCATACA CGGTGCCTGA CTGCGTTAGC AATTTAACTG TGATAAACTA CCGCATTA
2941 GCTTATCGAT GATAAGCTGT CAAACATGAG AATTCTTGAA GACGAAAGGG CCTCGTGATA
3001 CGCCTATTTT TATAGGTAA TGTCATGATA ATAATGGTTT CTTAGACGTC AGGTGGCACT
3061 TTTCGGGGAA ATGTGCGCGG AACCCCTATT TGTTTATTTT TCTAAATACA TTCAAATATG
3121 TATCCGCTCA TGAGACAATA ACCCTGATAA ATGCTTCAAT AATATTGAAA AAGGAAGAGT
3181 ATGAGTATTC AACATTTCCG TGTCGCCCTT ATTCCTTTT TTGCGGCATT TTGCCTTCCT
3241 GTTTTTGCTC ACCCAGAAAC GCTGGTGAAA GTAAAAAGATG CTGAAGATCA GTTGGGTGCA
3301 CGAGTGGGTT ACATCGAAT GGATCTCAAC AGCGGTAAAG TCCTTGAGAG TTTTCGCCCC
3361 GAAGAAGCTT TTCCAATGAT GAGCACTTTT AAAGTTCTGC TATGTGGCGC GGTATTATCC
3421 CGTGTTCAGC CCGGGCAAGA GCAACTCGGT CGCCGCATAC ACTATTCTCA GAATGACTTG
3481 GTTGAGTACT CACCAGTCAC AGAAAAGCAT CTTACGGATG GCATGACAGT AAGAGAATTA
3541 TGCAGTGCTG CCATAACCAT GAGTGATAAC ACTGCGGCCA ACTTACTTCT GACAACGATC
3601 GGAGGACCGA AGGAGCTAAC CGCTTTTTTG CACAACATGG GGGATCATGT AACTCGCCTT
3661 GATCGTTGGG AACCGGAGCT GAATGAAGCC ATACCAAACG ACGAGCGTGA CACCACGATG
3721 CCTGCAGCAA TGGCAACAAC GTTGCGCAA CTATTAACCTG GCGAACTACT TACTCTAGCT
3781 TCCCGGCAAC AATTAATAGA CTGGATGGAG GCGGATAAAG TTGCAGGACC ACTTCTGCGC
3841 TCGGCCCTTC CGGCTGGCTG GTTTATTGCT GATAAATCTG GAGCCGGTGA CCGTGGGTCT
3901 CGCGGTATCA TTGCAGCACT GGGGCCAGAT GGTAAAGCCCT CCCGTATCGT AGTTATCTAC
3961 ACGACGGGGA GTCAGGCAAC TATGGATGAA CGAAATAGAC AGATCGCTGA GATAGGTGCC
4021 TCACTGATTA AGCATTTGTA ACTGTCAGAC CAAGTTTACT CATATATACT TTAGATTGAT
4081 TTAAAACTTC ATTTTAAAT TAAAAGGATC TAGGTGAAGA TCCTTTTTGA TAATCTCATG
4141 ACCAAAAATCC CTTAACGTGA GTTTTCGTTT CACTGAGCGT CAGACCCCGT AGAAAAGATC
4201 AAAGGATCTT CTTGAGATCC TTTTTTCTG CGCGTAATCT GCTGCTTGCA AACAAAAA
4261 CCACCGCTAC CAGCGGTGGT TTGTTTGCCG GATCAAGAGC TACCAACTCT TTTTCCGAAG
4321 GTAACCTGGT TCAGCAGAGC GCAGATACCA AATACTGTCC TTCTAGTGTA GCCGTAGTTA
4381 GGCCACCACT TCAAGAACTC TGTCAGCCG CCTACATACC TCGCTCTGCT AATCCTGTTA
4441 CCAGTGGCTG CTGCCAGTGG CGATAAGTCG TGCTTACCG GGTGGAATC AAGACGATAG
4501 TTACCGGATA AGGCGCAGCG GTCGGGCTGA ACGGGGGGTT CGTGACACA GCCCGCTTG
4561 GAGCGAACGA CCTACACCGA ACTGAGATAC CTACAGCGTG AGCTATGAGA AAGCGCCACG
4621 CTTCCCGAAG GGAGAAAGGC GGACAGGTAT CCGGTAAGCG GCAGGGTCGG AACAGGAGAG
4681 CGCACGAGGG AGCTTCCAGG GGGAAACGCC TGCTATCTTT ATAGTCTGT CGGGTTTCGC
4741 CACCTCTGAC TTGAGCGTCG ATTTTGTGA TGCTCGTCAG GGGGGCGGAG CCTATGAAAA
4801 AACGCCAGCA ACGCGGCCTT TTTACGGTTC CTGGCCTTTT GCTGGCCTTT TGCTCACATG
4861 TTCTTCTCCT GCTTATCCCC TGATTCTGTG GATAACCGTA TTACCGCCTT TGAGTGAGCT
4921 GATACCGCTC GCCGCAGCCG AACGACCGAG CGCAGCGAGT CAGTGAGCGA GGAAGCGGAA
4981 GAGCGCCTGA TGCGGTATTT TCTCCTTACG CATCTGTGCG GTATTTTACA CCGCATATAT
5041 GGTGCACTCT CAGTACAATC TGCTCTGATG CCGCATAGTT AAGCCAGTAT ACACCTCCGT
5101 ATCGCTACGT GACTGGGTCA TGGCTGCGCC CCGACACCCG CCAACACCCG CTGACGCGCC
5161 CTGACGGGCT TGTCTGCTCC CGGCATCCGC TTACAGACAA GCTGTGACCG TCTCCGGGAG
5221 CTGCATGTGT CAGAGGTTTT CACCGTCATC ACCGAAACGC GCGAGGCAGC TGCGGTAAAG
5281 CTCATCAGCG TGGTCGTGAA GCGATTACCA GATGTCTGCC TGTTTCATCCG CGTCCAGCTC
5341 GTTGAGTTTC TCCAGAAGCG TTAATGTCTG GCTTCTGATA AAGCGGGCCA TGTTAAGGGC
5401 GGTTTTTTCC TGTTTGGTCA CTGATGCCTC CGTGTAAGGG GTATTCTGT TCATGGGGGT
5461 AATGATACCG ATGAAACGAG AGAGGATGCT CACGATACGG GTTACTGATG ATGAACATGC
5521 CCGGTTACTG GAACGTTGTG AGGGTAAACA ACTGGCGGTA TGGATGCGGC GGGACCAGAG
5581 AAAAATCACT CAGGGTCAAT GCCAGCGCTT CGTTAATACA GATGTAGGTG TTCCACAGGG
5641 TAGCCAGCAG CATCCTGCGA TGCAGATCCG GAACATAATG GTGCAGGGCG CTGACTTCCG
5701 CGTTTCCAGA CTTTACGAAA CACGGAAACC GAAGACCATT CATGTTGTTG CTCAGGTCCG
5761 AGACGTTTTG CAGCAGCAGT CGCTTACAGT TCGCTCGCGT ATCGGTGATT CATTCTGCTA
5821 ACCAGTAAGG CAACCCCGCC AGCCTAGCCG GGTCTTCAAC GACAGGAGCA CGATCATGCG
5881 CACCCGTGGC CAGGACCCAA CGCTGCCCCG GATGCGCCGC GTGCGGCTGC TGGAGATGGC
5941 GGACGCGATG GATATGTTCT GCCAAGGGTT GGTGTCGCA TTCACAGTTC TCCGCAAGAA
6001 TTGATTGGCT CCAATTCTTG GAGTGGTGAA TCCGTTAGCG AGGTGCCGCC GGCTTCCATT
6061 CAGGTCGAGG TGGCCCGGCT CCATGCACCG CGACGCAACG CGGGGAGGCA GACAAGGTAT
6121 AGGGCGGCGC CTACAATCCA TGCCAACCCG TTCCATGTGC TCGCCGAGGC GGCATAAATC -

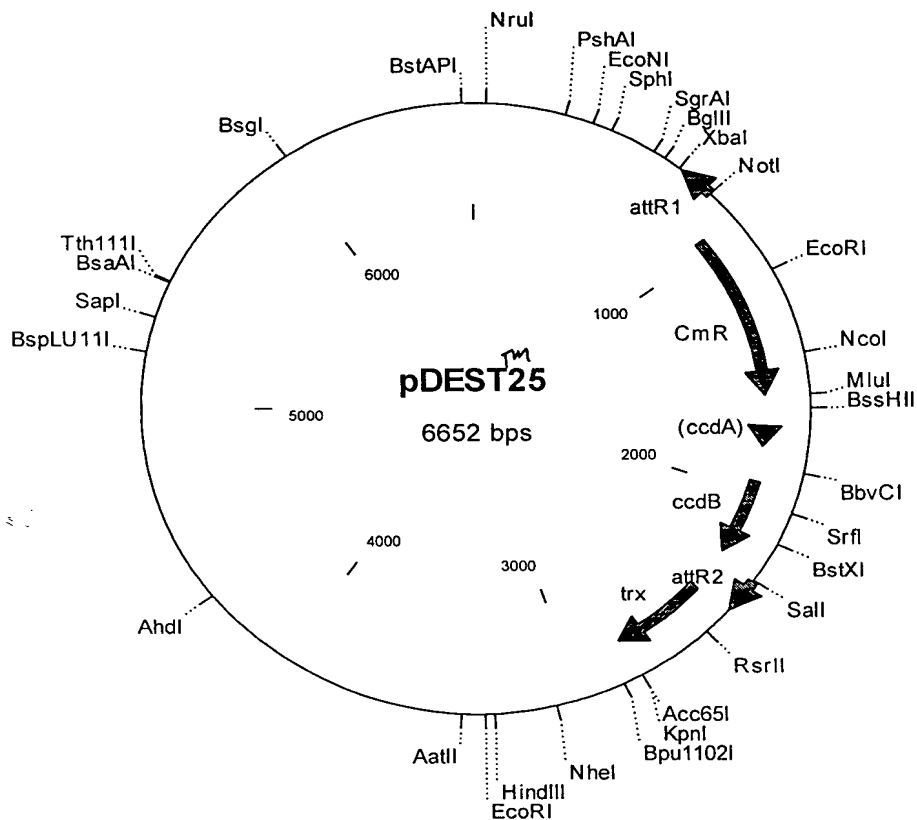
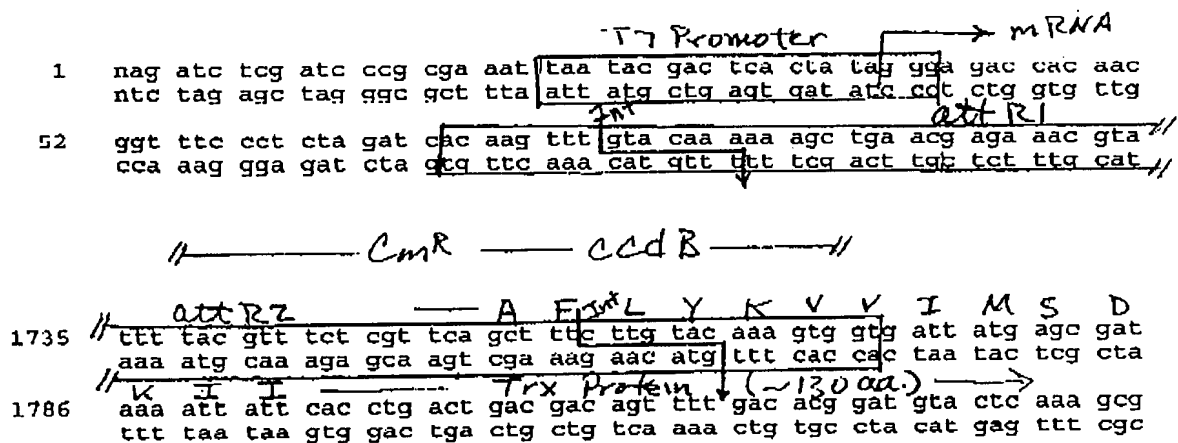
FIGURE 44C

6181 GCCGTGACGA TCAGCGGTCC AGTGATCGAA GTTAGGCTGG TAAGAGCCGC GAGCGATCCT
 6241 TGAAGCTGTC CCTGATGGTC GTCATCTACC TGCCTGGACA GCATGGCCTG CAACGCGGGC
 6301 ATCCCGATGC CGCCGGAAGC GAGAAGAATC ATAATGGGGA AGGCCATCCA GCCTCGCGTC
 6361 GCGAACGCCA GCAAGACGTA GCCCAGCGCG TCGGCCGCCA TGCCGGCGAT AATGGCCTGC
 6421 TTCTCGCCGA AACGTTTGGT GCGGGGACCA GTGACGAAGG CTTGAGCGAG GGCGTGCAAG
 6481 ATTCCGAATA CCGCAAGCGA CAGGCCGATC ATCGTCGCGC TCCAGCGAAA GCGGTCCTCG
 6541 CCGAAAATGA CCCAGAGCGC TGCCGGCACC TGTCCCTACGA GTTGCATGAT AAAGAAGACA
 6601 GTCATAAGTG CGGCGACGAT AGTCATGCCC CGCGCCCACC GGAAGGAGCT GACTGGGTTG
 6661 AAGGCTCTCA AGGGCATCGG TCGATCGACG CTCTCCCTTA TGCGACTCCT GCATTAGGAA
 6721 GCAGCCCAGT AGTAGGTTGA GGCCGTTGAG CACCGCCGCC GCAAGGAATG GTGCATGCAA
 6781 GGAGATGGCG CCCAACAGTC CCCC GGCCAC GGGGCCTGCC ACCATACCCA CGCCGAAACA
 6841 AGCGCTCATG AGCCCGAAGT GGCGAGCCCG ATCTTCCCCA TCGGTGATGT CGGCGATATA
 6901 GGCGCCAGCA ACCGCACCTG TGGCGCCGGT GATGCCGGCC ACGATGCGTC CGGCGTAGAG
 6961 G

FIGURE 44D

FIGURE 45A

pDEST25 Thioredoxin carboxy-fusion vector, T7 promoter



pDEST25 6652 bp

Location (Base Nos.)	Gene Encoded
844..720	attR1
953..1612	CmR
1732..1816	inactivated ccdA
1954..2259	ccdB
2300..2424	attR2
2432..2794	trx

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1 CCGGAAGCGA GAAGAATCAT AATGGGGAAG GCCATCCAGC CTCGCGTCGC GAACGCCAGC
61 AAGACGTAGC CCAGCGCGTC GGCCGCCATG CCGGCGATAA TGGCCTGCTT CTCGCCGAAA
121 CGTTTGGTGG CGGGACCAGT GACGAAGGCT TGAGCGAGGG CGTGCAAGAT TCCGAATACC
181 GCAAGCGACA GGCCGATCAT CGTCGCGCTC CAGCGAAAGC GGTCCCTCGCC GAAAATGACC
241 CAGAGCGCTG CCGGCACCTG TCCTACGAGT TGCATGATAA AGAAGACAGT CATAAGTGCG
301 GCGACGATAG TCATGCCCCG CGCCCACCGG AAGGAGCTGA CTGGGTTGAA GGCTCTCAAG
361 GGCATCGGTC GATCGACGCT CTCCCTTATG CGACTCCTGC ATTAGGAAGC AGCCAGTAG
421 TAGGTTGAGG CCGTTGAGCA CCGCCGCCGC AAGGAATGGT GCATGCAAGG AGATGGCGCC
481 CAACAGTCCC CCGGCCACGG GGCCTGCCAC CATACCACG CCGAAACAAG CGCTCATGAG
541 CCCGAAGTGG CGAGCCCGAT CTTCCCCATC GGTGATGTCG GCGATATAGG CGCCAGCAAC
601 CGCACCTGTG GCGCCGGTGA TGCCGGCCAC GATGCGTCCG GCGTAGAGGA TCGAGATCTC
661 GATCCCGCGA AATTAATACG ACTCACTATA GGGAGACCAC AACGGTTTCC CTCTAGATCA
721 CAAGTTTGTA CAAAAAAGCT GAACGAGAAA CGTAAATGA TATAAATATC AATATATTAA
781 ATTAGATTTT GCATAAAAAA CAGACTACAT AATACTGTAA AACACAACAT ATCCAGTCAC
841 TATGGCGGCC GCATTAGGCA CCCAGGCTT TACACTTTAT GCTTCCGGCT CGTATAATGT
901 GTGGATTTTG AGTTAGGATC CGGCGAGATT TTCAGGAGCT AAGGAAGCTA AAATGGAGAA
961 AAAAATCACT GGATATACCA CCGTTGATAT ATCCCAATGG CATCGTAAAG AACATTTTGA
1021 GGCATTTTCAG TCAGTTGCTC AATGTACCTA TAACCAGACC GTTCAGCTGG ATATTACGGC
1081 CTTTTTAAAG ACCGTAAAGA AAAATAAGCA CAAGTTTTAT CCGGCCTTTA TTCACATTCT
1141 TGCCCGCCTG ATGAATGCTC ATCCGGAATT CCGTATGGCA ATGAAAGACG GTGAGCTGGT
1201 GATATGGGAT AGTGTTTACC CTTGTTACAC CGTTTTCCAT GAGCAAACCTG AAACGTTTTTC
1261 ATCGCTCTGG AGTGAATACC ACGACGATTT CCGGCAGTTT CTACACATAT ATTCGCAAGA
1321 TGTGGCGTGT TACGGTGAAA ACCTGGCCTA TTTCCCTAAA GGGTTTATTG AGAATATGTT
1381 TTTCGTCTCA GCCAATCCCT GGGTGAGTTT CACCAGTTTT GATTTAAACG TGGCCAATAT
1441 GGACAACTTC TTCGCCCCCG TTTTCACCAT GGGCAAATAT TATACGCAAG GCGACAAGGT
1501 GCTGATGCCG CTGGCGATTG AGGTTTCATG TGCCGTCTGT GATGGCTTCC ATGTCGGCAG
1561 AATGCTTAAT GAATTACAAC AGTACTGCGA TGAGTGGCAG GGCGGGGCGT AAACGCGTGG
1621 ATCCGGCTTA CTAAAAGCCA GATAACAGTA TGCGTATTTG CGCGCTGATT TTTGCGGTAT
1681 AAGAATATAT ACTGATATGT ATACCCGAAG TATGTCAAAA AGAGGTGTGC TATGAAGCAG
1741 CGTATTACAG TGACAGTTGA CAGCGACAGC TATCAGTTGC TCAAGGCATA TATGATGTCA
1801 ATATCTCCGG TCTGGTAAGC ACAACCATGC AGAATGAAGC CCGTCGTCTG CGTGCCGAAC
1861 GCTGGAAAGC GGAAAATCAG GAAGGGATGG CTGAGGTCGC CCGGTTTATT GAAATGAACG
1921 GCTCTTTTGC TGACGAGAAC AGGGACTGGT GAAATGCAGT TTAAGGTTTA CACCTATAAA
1981 AGAGAGAGCC GTTATCGTCT GTTTGTGGAT GTACAGAGTG ATATTATTGA CACGCCCCGG
2041 CGACGGATGG TGATCCCCCT GGCCAGTGCA CGTCTGCTGT CAGATAAAGT CTCCCGTGAA
2101 CTTTACCCGG TGGTGTCATAT CGGGGATGAA AGCTGGCGCA TGATGACCAC CGATATGGCC
2161 AGTGTGCCGG TCTCCGTTAT CGGGGAAGAA GTGGCTGATC TCAGCCACCG CGAAAATGAC
2221 ATCAAAAACG CCATTAACCT GATGTTCTGG GGAATATAAA TGTCAGGCTC CTTATACAC
2281 AGCCAGTCTG CAGGTCGACC ATAGTGACTG GATATGTTGT GTTTTACAGT ATTATGTAGT
2341 CTGTTTTTTA TGCAAAATCT AATTTAATAT ATTGATATTT ATATCATTTT ACGTTTCTCG
2401 TTCAGCTTTC TTGTACAAAG TGGTGATTAT GAGCGATAAA ATTATTCACC TGAAGTACGA
2461 CAGTTTTGAC ACGGATGTAC TCAAAGCGGA CGGGGCGATC CTCGTCGATT TCTGGGCAGA
2521 GTGGTCCGGT CCGTGCAAAA TGATCGCCCC GATTCTGGAT GAAATCGCTG ACGAATATCA
2581 GGGCAAACTG ACCGTTGCAA AACTGAACAT CGATCAAAAC CCTGGCACTG CGCCGAAATA
2641 TGGCATCCGT GGTATCCCGA CTCTGCTGCT GTTCAAAAAC GGTGAAGTGG CGGCAACCAA
2701 AGTGGGTGCA CTGTCTAAAG GTCAGTTGAA AGAGTTCCTC GACGCTAACC TGGCCGGTTC
2761 TGGTTCTGGT GATGACGATG ACAAGGTACC CGGGGATCGA TCCGGCTGCT AACAAAGCCC

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Figure 45B

2821 GAAAGGAAGC TGAGTTGGCT GCTGCCACCG CTGAGCAATA ACTAGCATAA CCCCTTGGGG
2881 CCTCTAAACG GGTCTTGAGG GGTTTTTTGC TGAAAGGAGG AACTATATCC GGATATCCAC
2941 AGGACGGGTG TGGTCGCCAT GATCGCGTAG TCGATAGTGG CTCCAAGTAG CGAAGCGAGC
3001 AGGACTGGGC GCGGCCAAA GCGGTCGGAC AGTGCTCCGA GAACGGGTGC GCATAGAAAT
3061 TGCATCAACG CATATAGCGC TAGCAGCACG CCATAGTGAC TGGCGATGCT GTCGGAATGG
3121 ACGATATCCC GCAAGAGGCC CGGCAGTACC GGCATAACCA AGCCTATGCC TACAGCATCC
3181 AGGGTGACGG TGCCGAGGAT GACGATGAGC GCATTGTTAG ATTTTCATACA CGGTGCCTGA
3241 CTGCGTTAGC AATTTAACTG TGATAAACTA CCGCATTAAA GCTTATCGAT GATAAGCTGT
3301 CAAACATGAG AATTCTTGAA GACGAAAAGG CCTCGTGATA CGCCTATTTT TATAGGTTAA
3361 TGTCATGATA ATAATGGTTT CTTAGACGTC AGGTGGCACT TTTCGGGGAA ATGTGCGCGG
3421 AACCCTATT TGTATTATTT TCTAAATACA TTCAAATATG TATCCGCTCA TGAGACAATA
3481 ACCCTGATAA ATGCTTCAAT AATATTGAAA AAGGAAGAGT ATGAGTATTC AACATTTCCG
3541 TGTCGCCCTT ATTCCCTTTT TTGCGGCATT TTGCCTTCCT GTTTTTTGCTC ACCCAGAAAC
3601 GCTGGTGAAA GTAAAAGATG CTGAAGATCA GTTGGGTGCA CGAGTGGGT ACATCGAACT
3661 GGATCTCAAC AGCGGTAAGA TCCTTGAGAG TTTTCGCCCC GAAGAACGTT TTCCAATGAT
3721 GAGCACTTTT AAAGTTCTGC TATGTGGCGC GGTATTATCC CGTGTGACG CCGGGCAAGA
3781 GCAACTCGGT CGCCGCATAC ACTATTCTCA GAATGACTTG GTTGAGTACT CACCAGTCAC
3841 AGAAAAGCAT CTTACGGATG GCATGACAGT AAGAGAATTA TGCAGTGCTG CCATAACCAT
3901 GAGTGATAAC ACTGCGGCCA ACTTACTTCT GACAACGATC GGAGGACCGA AGGAGCTAAC
3961 CGCTTTTTTG CACAACATGG GGGATCATGT AACTCGCCTT GATCGTTGGG AACCAGGACT
4021 GAATGATGCG ATACCAAACG ACGAGCGTGA CACCACGATG CCTGCAGCAA TGGCAACAAC
4081 GTTGCGCAAA CTATTAACCTG GCGAACTACT TACTCTAGCT TCCCGGCAAC AATTAATAGA
4141 CTGGATGGAG CCGGATAAAG TTGCAGGACC ACTTCTGCGC TCGGCCCTTC CGGCTGGCTG
4201 GTTTATTGCT GATAAATCTG GAGCCGGTGA GCGTGGGTCT CGCGGTATCA TTGCAGCACT
4261 GGGGCCAGAT GGTAAGCCCT CCCGTATCGT AGTTATCTAC ACGACGGGGA GTCAGGCAAC
4321 TATGGATGAA CGAAATAGAC AGATCGCTGA GATAGGTGCC TCACTGATTA AGCATTGGTA
4381 ACTGTCAGAC CAAGTTTACT CATATATACT TTAGATTGAT TTAAAACTTC ATTTTTAATT
4441 TAAAAGGATC TAGGTGAAGA TCCTTTTTGA TAATCTCATG ACCAAAATCC CTTAACGTGA
4501 GTTTTCGTTT CACTGAGCGT CAGACCCCGT AGAAAAGATC AAAGGATCTT CTTGAGATCC
4561 TTTTTTCTG CGCGTAATCT GCTGCTTGCA AACAAAAAA CCACCGCTAC CAGCGGTGGT
4621 TTGTTTGCCG GATCAAGAGC TACCAACTCT TTTTCCGAAG GTAAGTGGCT TCAGCAGAGC
4681 GCAGATACCA AATACTGTCC TTCTAGTGTA GCCGTAGTTA GGCCACCACT TCAAGAACTC
4741 TGTAGCACCG CCTACATACC TCGCTCTGCT AATCCTGTTA CCAGTGGCTG CTGCCAGTGG
4801 CGATAAGTCG TGTCTTACCG GGTGGGACTC AAGACGATAG TTACCGGATA AGGCGCAGCG
4861 GTCGGGCTGA ACGGGGGGTT CGTGACACAC GCCCAGCTTG GAGCGAACA CTTACACCGA
4921 ACTGAGATAC CTACAGCGTG AGCTATGAGA AAGCGCCACG CTTCCCAAG GGAGAAAGGC
4981 GGACAGGTAT CCGGTAAGCG GCAGGGTCGG AACAGGAGAG CGCACGAGGG AGCTTCCAGG
5041 GGGAAACGCC TGGTATCTTT ATAGTCCTGT CGGGTTTTGC CACCTCTGAC TTGAGCGTCG
5101 ATTTTTGTGA TGCTCGTCAG GGGGGCGGAG CCTATGGAAA AACGCCAGCA ACGCGCCTT
5161 TTTACGGTTC CTGGCCTTTT GCTGGCCTTT TGCTCACATG TTCTTTCTCTG CGTTATCCCC
5221 TGATTCTGTG GATAACCGTA TTACCGCCTT TGAGTGAGCT GATACCGCTC GCCGAGCCG
5281 AACGACCGAG CGCAGCGAGT CAGTGAGCGA GGAAGCGGAA GAGCGCCTGA TCGGGTATTT
5341 TCTCCTTACG CATCTGTGCG GTATTTTACA CCGCATATAT GGTGCACTCT CAGTACAATC
5401 TGCTCTGATG CCGCATAGTT AAGCCAGTAT ACACTCCGCT ATCGCTACGT GACTGGGTCA
5461 TGGCTGCGCC CCGACACCCG CCAACACCCG CTGACGCGCC CTGACGGGCT TGTCTGCTCC
5521 CGGCATCCGC TTACAGACAA GCTGTGACCG TCTCCGGGAG CTGCATGTGT CAGAGGTTTT
5581 CACCGTCATC ACCGAAACGC GCGAGGCAGC TGCGGTAAAG CTCATCAGCG TGGTCGTGAA
5641 GCGATTACAC GATGTCTGCC TGTTTCATCCG CGTCCAGCTC GTTGAGTTTC TCCAGAAGCG
5701 TTAATGTCTG GCTTCTGATA AAGCGGGCCA TGTTAAGGGC GGTTTTTTCC TGTTTGGTCA
5761 CTGATGCCTC CGTGTAAGGG GGATTTCTGT TCATGGGGGT AATGATACCG ATGAAACGAG
5821 AGAGTAGTCT CACGATACGG GTTACTGATG ATGAACATGC CCGGTTACTG GAACGTTGTG
5881 AGGGTAAACA ACTGGCGGTA TGGATGCGGC GGGACCAGAG AAAAATCACT CAGGGTCAAT
5941 GCCAGCGCTT CGTTAATACA GATGTAGGTG TTCCACAGGG TAGCCAGCAG CATCCTGCGA
6001 TGCAGATCCG GAACATAATG GTGCAGGGCG CTGACTTCCG CGTTTCCAGA CTTTACGAAA
6061 CACGGAACCC GAAGACCATT CATGTTGTTG CTCAGGTCGC AGACGTTTTG CAGCAGCAGT
6121 CGCTTACAGT TCGCTCGCGT ATCGGTGATT CATTCTGCTA ACCAGTAAGG CAACCCCGCC
6181 AGCCTAGCCG GGTCTCAAC GACAGGAGCA CGATCATGCG CACCCGTGGC CAGGACCCAA
6241 CGCTGCCCCG GATGCGCCGC GTGCGGCTGC TGGAGATGGC GGACGCGATG GATATGTTCT

6301 GCCAAGGGTT GGTTCGCGCA TTCACAGTTC TCCGCAAGAA TTGATTGGCT CCAATTCTTG
 6361 GAGTGGTGAA TCCGTTAGCG AGGTGCCGCC GGCTTCCATT CAGGTCGAGG TGGCCCGGCT
 6421 CCATGCACCG CGACGCAACG CGGGGAGGCA GACAAGGTAT AGGGCGGCGC CTACAATCCA
 6481 TGCCAACCCG TTCCATGTGC TCGCCGAGGC GGCATAAATC GCCGTGACGA TCAGCGGTCC
 6541 AGTGATCGAA GTTAGGCTGG TAAGAGCCGC GAGCGATCCT TGAAGCTGTC CCTGATGGTC
 6601 GTCATCTACC TGCCTGGACA GCATGGCCTG CAACGCGGGC ATCCCGATGC CG

FIGURE 45D

FIGURE 46A

pDEST26 His6 Amino Fusion in pCMV Sport-neo Vector

```

600   ttg acg tca atg gga gtt tgt ttt ggc acc aaa atc aac ggg act ttc caa
      aac tgc agt tac cct caa aca aaa cgc tgg ttt tag ttg ccc tga aag gtt

651   aat gtc gta aca act cgc ccc cat tga cgc aaa tgg gcg gta ggc gtg tac
      tta cag cat tgt tga ggc ggg gta act cgc ttt acc cgc cat ccg cac atg

702   // ggt ggg agg tct ata taa gca gag ctc gtt tag tga acc gtc aga tgc tct
      // cca ccc tcc aga tat att cgt ctc gag caa atc act tgg cag tct ago gga

753   gga gac gcc atc cac gct gtt ttg acc tcc ata gaa gac acc ggg acc gat
      cct ctg cgg tag gtg cga caa aac tgg agg tat ctt ctg tgg ccc tgg cta

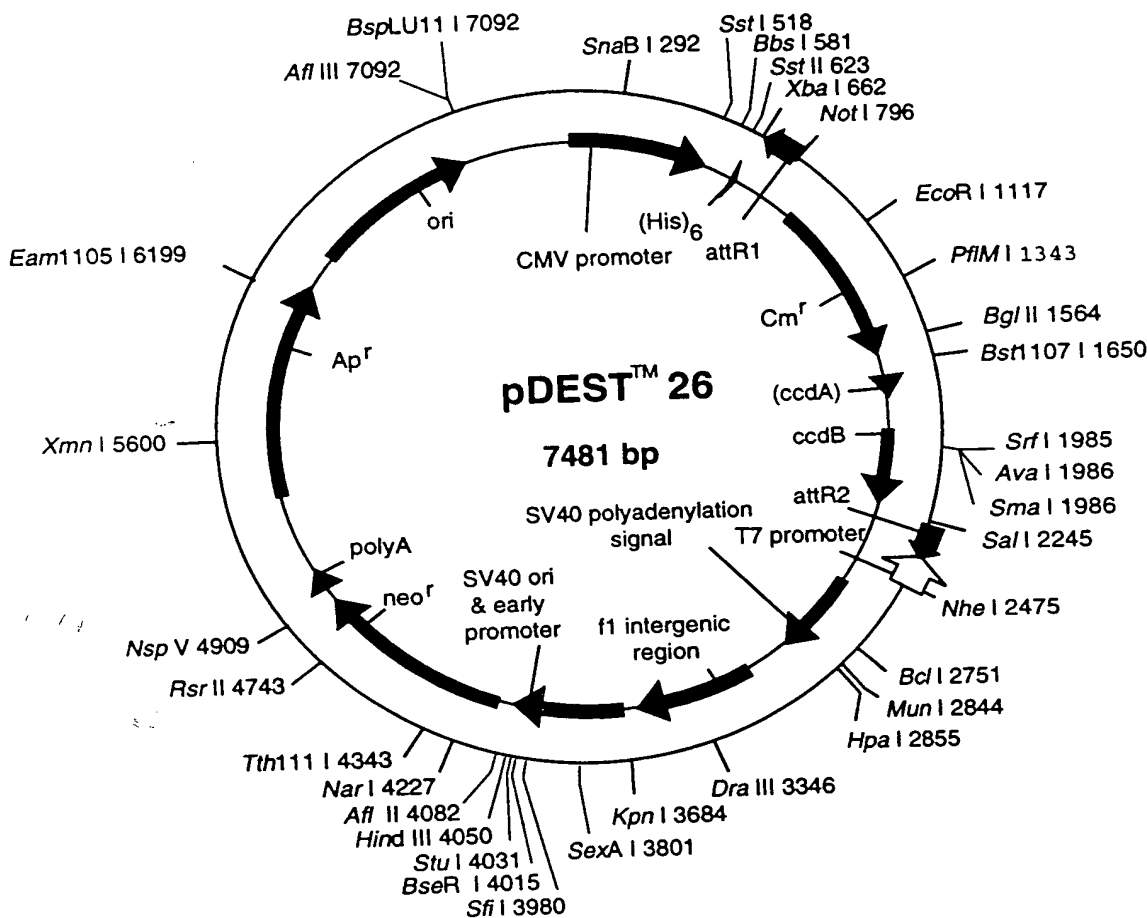
804   cca gcc tcc gga ctc tag cct agg cgc cgg acc atg gcg tac tac cat caa
      ggt cgg agg cct gag atc gga tcc ggc gcc tgg tac cgc atg atg gta gtg

855   H H H H S R S I S I Y K K A CcdA
      cat cac cat cac tct aga tca aca agt ttg tac aaa aaa gct gaa cga gaa
      gta gtg gta gtg aga tct agt tgt tca aac atg ttt ttt cga ctt gct ctt
  
```

CMV Promoter →

Start Transl →

Int ↓



09517466-030200

pDEST26 7481 bp

Location (Base Nos.)

Gene Encoded

492..509	his6
619..519	attR1
752..1411	CmR
1531..1615	inactivated ccdA
1753..2058	ccdB
2099..2223	attR2
2409..2771	SV40 polyA
2966..3421	f1 intergenic region
3485..3903	SV40 promoter
3948..4742	neo
4806..4854	polyA
5265..6125	Apr
6274..6913	ori
7344..385	CMV promoter

```

1  GTAAACTGCC CACTTGGCAG TACATCAAGT GTATCATATG CCAAGTACGC CCCCTATTGA
61 CGTCAATGAC GGTAATGGC CCGCCTGGCA TTATGCCCAG TACATGACCT TATGGGACTT
121 TCCTACTTGG CAGTACATCT ACGTATTAGT CATCGCTATT ACCATGGTGA TGCGGTTTTG
181 GCAGTACATC AATGGGCGTG GATAGCGGTT TGACTCACGG GGATTTCCAA GTCTCCACCC
241 CATTGACGTC AATGGGAGTT TGTTTTGGCA CCAAAATCAA CGGGACTTTC CAAAATGTCT
301 TAACAACTCC GCCCCATTGA CGCAAATGGG CGGTAGGCGT GTACGGTGGG AGGTCTATAT
361 AAGCAGAGCT CGTTTAGTGA ACCGTCAGAT CGCCTGGAGA CGCCATCCAC GCTGTTTGA
421 CCTCCATAGA AGACACCGGG ACCGATCCAG CCTCCGGACT CTAGCCTAGG CCGCGGACCA
481 TGGCGTACTA CCATCACCAT CACCATCACT CTAGATCAAC AAGTTTGTAC AAAAAAGCTG
541 AACGAGAAAC GTAAATGAT ATAAATATCA ATATATTAAA TTAGATTTTG CATAAAAAAC
601 AGACTACATA ATACTGTAAA ACACAACATA TCCAGTCACT ATGGCGGCCG CATTAGGCAC
661 CCCAGGCTTT ACACCTTTATG CTTCCGGCTC GTATAATGTG TGGATTTTGA GTTAGGATCC
721 GGCGAGATTT TCAGGAGCTA AGGAAGCTAA AATGGAGAAA AAAATCACTG GATATACCAC
781 CGTTGATATA TCCCAATGGC ATCGTAAAGA ACATTTTGAG GCATTTCAGT CAGTTGCTCA
841 ATGTACCTAT AACCAGACCG TTCAGCTGGA TATTACGGCC TTTTAAAGA CCGTAAAGAA
901 AAATAAGCAC AAGTTTTATC CGGCCTTTAT TCACATTCTT GCCCGCCTGA TGAATGCTCA
961 TCCGGAATTC CGTATGGCAA TGAAAGACGG TGAGCTGGTG ATATGGGATA GTGTTCAACC
1021 TTGTTACACC GTTTTCCATG AGCAAACCTGA AACGTTTTCA TCGCTCTGGA GTGAATACCA
1081 CGACGATTTT CGGCAGTTTC TACACATATA TTCGCAAGAT GTGGCGTGTT ACGGTGAAAA
1141 CCTGGCCTAT TTCCCTAAAG GGTTTATTGA GAATATGTTT TTCGTCTCAG CCAATCCCTG
1201 GGTGAGTTTC ACCAGTTTTG ATTTAAACGT GGCCAATATG GACAACCTCT TCGCCCCCGT
1261 TTTCACCATG GGCAAATATT ATACGCAAGG CGACAAGGTG CTGATGCCGC TGGCGATTCA
1321 GGTTCATCAT GCCGTCTGTG ATGGCTTCCA TGTCGGCAGA ATGCTTAATG AATTACAACA
1381 GTACTGCGAT GAGTGGCAGG GCGGGGCGTA AAGATCTGGA TCCGGCTTAC TAAAAGCCAG
1441 ATAACAGTAT GCGTATTTGC GCGCTGATTT TTGCGGTATA AGAATATATA CTGATATGTA
1501 TACCCGAAGT ATGTCAAAAA GAGGTGTGCT ATGAAGCAGC GTATTACAGT GACAGTTGAC
1561 AGCGACAGCT ATCAGTTGCT CAAGGCATAT ATGATGTCAA TATCTCCGGT CTGGTAAGCA
1621 CAACCATGCA GAATGAAGCC CGTCGTCTGC GTGCCGAACG CTGGAAAGCG GAAAATCAGG
1681 AAGGGATGGC TGAGGTCGCC CGGTTTATTG AAATGAACGG CTCTTTTGCT GACGAGAAAC
1741 GGGACTGGTG AAATGCAGTT TAAGGTTTAC ACCTATAAAA GAGAGAGCCG TTATCGTCTG
1801 TTTGTGGATG TACAGAGTGA TATTATTGAC ACGCCCGGGC GACGGATGGT GATCCCCCTG
1861 GCCAGTGCAC GTCTGCTGTC AGATAAAGTC TCCCGTGAAC TTTACCCGGT GGTGCATATC
1921 GGGGATGAAA GCTGGCGCAT GATGACCACC GATATGGCCA GTGTGCCGGT CTCCGTTATC
1981 GGGGAAGAAG TGGCTGATCT CAGCCACCGC GAAAATGACA TCAAAAACGC CATTAACCTG
2041 ATGTTCTGGG GAATATAAAT GTCAGGCTCC CTTATACACA GCCAGTCTGC AGGTTCGACCA
2101 TAGTGACTGG ATATGTTGTG TTTTACAGTA TTATGTAGTC TGTTTTTTAT GCAAAATCTA
2161 ATTTAATATA TTGATATTTA TATCATTTTA CGTTTCTCGT TCAGCTTTCT TGTACAAAGT
2221 GGTTGATCGC GTGCATGCGA CGTCATAGCT CTCTCCCTAT AGTGAGTCGT ATTATAAGCT
2281 AGGCACTGGC CGTCGTTTTA CAACGTCGTG ACTGGGAAAA CTGCTAGCTT GGGATCTTTG -

```

Figure 46B

CAACGTTGCG CAAACTATTA ACTGGCGAAC TACTTACTCT AGCTTCCCCG CAACAATTAA
TAGACTGGAT GGAGGCGGAT AAAGTTGCAG GACCACTTCT GCGCTCGGCC CTTCCGGCTG
GCTGGTTTAT TGCTGATAAA TCTGGAGCCG GTGAGCGTGG GTCTCGCGGT ATCATTGCAG
CACTGGGGCC AGATGGTAAG CCTTCCCGTA TCGTAGTTAT CTACACGACG GGGAGTCAGG
CAACTATGGA TGAACGAAAT AGACAGATCG CTGAGATAGG TGCCTCACTG ATTAAGCATT
GGTAAC TGTC AGACCAAGTT TACTCATATA TACTTTAGAT TGATTTAAAA CTTCAATTTT
AATTTAAAG GATCTAGGTG AAGATCCTTT TTGATAATCT CATGACCAAA ATCCCTTAAC
GTGAGTTTTT GTTCCACTGA GCGTCAGACC CCGTAGAAAA GATCAAAGGA TCTTCTTGAG
ATCCTTTTTT TCTGCGCGTA ATCTGCTGCT TGCAAACAAA AAAACCACCG CTACCAGCGG
TGGTTTGT TTGCCGATCAA GAGCTACCAA CTCTTTTTTCC GAAGGTAAC TTGCTTCAAG
GAGCGCAGAT ACCAAATACT GTCCTTCTAG TGTAGCCGTA GTTAGGCCAC CACTTCAAGA
ACTCTGTAGC ACCGCTACA TACCTCGCTC TGCTAATCCT GTTACCAGTG GCTGCTGCCA
GTGGCGATAA GTCGTGTCTT ACCGGGTTGG ACTCAAGACG ATAGTTACCG GATAAGGCGC
AGCGGTCGGG CTGAACGGGG GGTTTCGTGCA CACAGCCCAG CTTGGAGCGA ACGACCTACA
CCGAAC TGAG ATACCTACAG CGTGAGCATT GAGAAAGCGC CACGCTTCCC GAAGGGAGAA
AGGCGGACAG GTATCCGGTA AGCGGCAGGG TCGGAACAGG AGAGCGCACG AGGGAGCTTC
CAGGGGGAAA CGCCTGGTAT CTTTATAGTC CTGTGCGGTT TCGCCACCTC TGAATTGAGC
GTCGATTTTT GTGATGCTCG TCAGGGGGGC GGAGCCTATG GAAAAACGCC AGCAACGCGG
CCTTTTACG GTTCCTGGCC TTTTGCTGGC CTTTTGCTCA CATGTTCTTT CTTGCGTTAT
CCCCTGATTC TGTGGATAAC CGTATTACCG CTTTTGAGTG AGCTGATACC GCTCGCCGCA
GCCGAACGAC CGAGCGCAGC GAGTCAGTGA GCGAGGAAGC GGAAGAGCGC CCAATACGCA
AACC CGCTCT CCCC CGCGT TGGCCGATC ATTAATGCAG AGCTTGCAAT TCGCGCGTTT
TTCAATATTA TTGAAGCATT TATCAGGGTT ATTGTCTCAT GAGCGGATAC ATATTTGAAT
GTATTTAGAA AAATAAACAA ATAGGGGTTT CGCGCACATT TCCCCGAAAA GTGCCACCTG
ACGTCTAAGA AACCATTATT ATCATGACAT TAACCTATAA AAATAGGCGT AGTACGAGGC
CCTTTCACTC ATTAGATGCA TGTCGTTACA TAACTTACGG TAAATGGCCC GCCTGGCTGA
CCGCCAACG ACCCCCGCCC ATTGACGTCA ATAATGACGT ATGTTCCCAT AGTAACGCCA
ATAGGGACTT TCCATTGACG TCAATGGGTG GAGTATTAC G

FIGURE 46D

Figure 47A

pDEST 27 GST Amino Fusion in pCMV Sport-neo Vector

CMV Promoter

600 // nac ggt ggg agg tct ata taa gca gag ctc gtt tag tga acc gtc aga tgg
 // ntg cca ccc tcc aga tat att cgt ctc gag caa atc act tgg dag tct agc

651 cct gga gac gcc atc cac gct gtt ttg acc tcc ata gaa gac acc ggg acc
 gga cct ctg cgg tag gtg cga caa aac tgg agg tat ctt ctg tgg ccc tgg

702 gat cca gcc tcc gga ctc tag cct agg ccg cgg acc atg gcc cct ata cta
 cta ggt cgg agg cct gag atc gga tcc ggc gcc tgg tac cgg gga tat gat

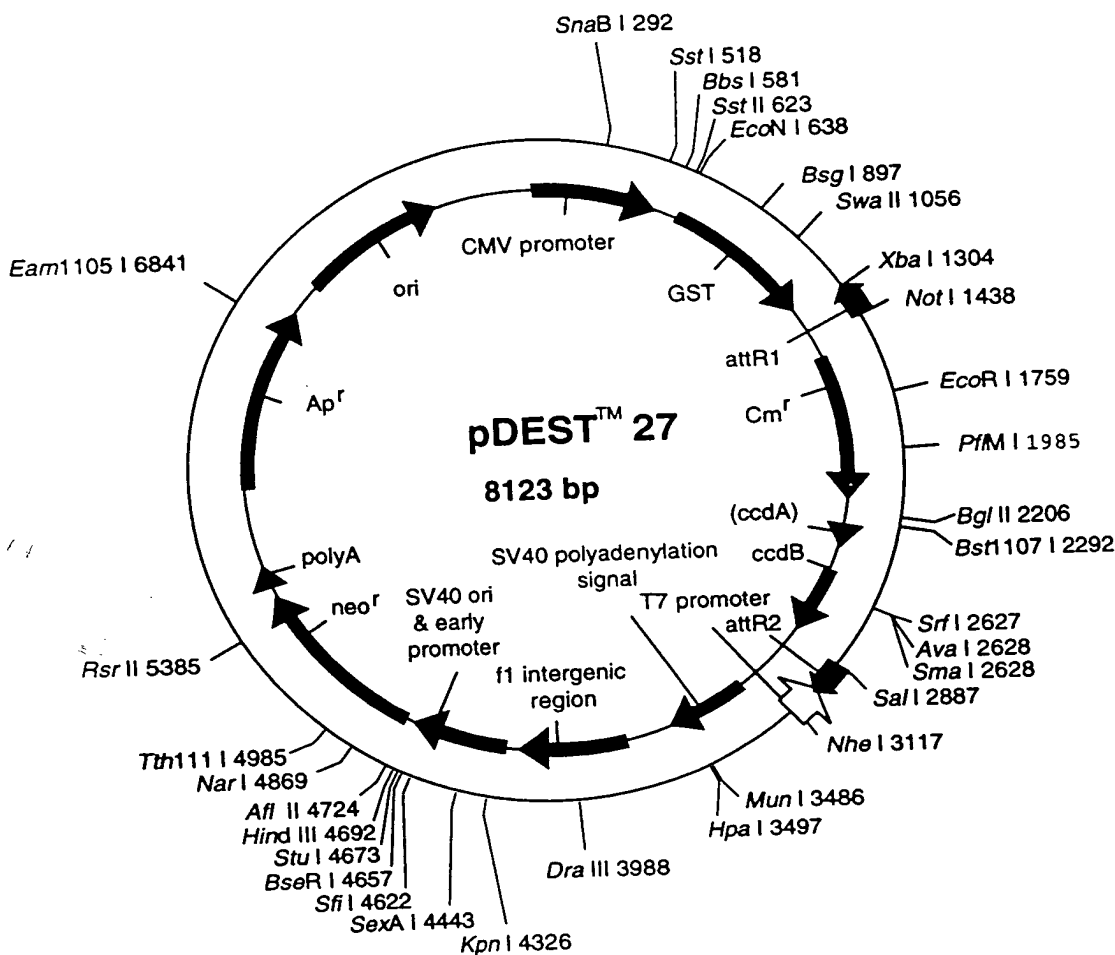
753 ggt tat tgg aaa att aag ggc ctt gtg caa ccc act cga ctt ctt ttg gaa
 cca ata acc ttt taa ttc ccg gaa cac gtt ggg tga gct gaa gaa aac ctt

804 tat ctt gaa gaa aaa tat gaa gag cat ttg tat gag cgc gat gaa ggt gat
 ata gaa ctt ctt ttt ata ctt ctc gta aac ata ctc gcg cta ctt cca cta

1365 // ttt ggt ggt ggc gac cat cct cca aaa tgg gat ctg gtt ccg cgt cct aga
 // aaa cca cca ccg ctg gta gga ggt ttt agc cta gac caa ggc gca aga tct

1416 S T S L Y K K A
 tca aca agt ttg tac aaa aaa gct gaa cga gaa acg
 agt tgt tca aac atg ttt ttt cga ctt gct ctt tgc

Int attR1



pDEST27 8123 bp (rotated to position 7800)

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
130..793	GST
803..927	attR1
1036..1695	CmR
1815..1899	inactivated ccdA
2037..2342	ccdB
2383..2507	attR2
2693..3055	SV40 polyA
3250..3705	f1 intergenic region
3769..4187	SV40 promoter
4232..5026	neo
5090..5138	polyA
5549..6409	Apr
6558..7197	ori
7628..27	CMV promoter

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1 ATAAGCAGAG CTCGTTTAGT GAACCGTCAG ATCGCCTGGA GACGCCATCC ACGCTGTTTT
61 GACCTCCATA GAAGACACCG GGACCGATCC AGCCTCCGGA CTCTAGCCTA GGCCGCGGAC
121 CATGGCCCCCT ATACTAGGTT ATTGGAAAAT TAAGGGCCTT GTGCAACCCA CTCGACTTCT
181 TTTGGAATAT CTTGAAGAAA AATATGAAGA GCATTTGTAT GAGCGCGATG AAGGTGATAA
241 ATGGCGAAAC AAAAAGTTTG AATTGGGTTT GGAGTTTCCC AATCTTCCTT ATTATATTGA
301 TGGTGATGTT AAATTAACAC AGTCTATGGC CATCATACGT TATATAGCTG ACAAGCACAA
361 CATGTTGGGT GGTTGTCCAA AAGAGCGTGC AGAGATTTCA ATGCTTGAAG GAGCGGTTTT
421 GGATATTAGA TACGGTGTTT CGAGAATTGC ATATAGTAAA GACTTTGAAA CTCTCAAAGT
481 TGATTTTCTT AGCAAGCTAC CTGAAATGCT GAAAATGTTC GAAGATCGTT TATGTCATAA
541 AACATATTTA AATGGTGATC ATGTAACCCA TCCTGACTTC ATGTTGTATG ACGCTCTTGA
601 TGTTGTTTTA TACATGGACC CAATGTGCCT GGATGCGTTC CCAAAATTAG TTTGTTTTAA
661 AAAACGTATT GAAGCTATCC CACAAATTGA TAAGTACTTG AAATCCAGCA AGTATATAGC
721 ATGGCCTTTG CAGGGCTGGC AAGCCACGTT TGGTGGTGGC GACCATCCTC CAAAATCGGA
781 TCTGGTTCCG CGTTC TAGAT CAACAAGTTT GTACAAAAAA GCTGAACGAG AAACGTAAAA
841 TGATATAAAT ATCAATATAT TAAATTAGAT TTTGCATAAA AAACAGACTA CATAATACTG
901 TAAAACACAA CATATCCAGT CACTATGGCG GCCGCATTAG GCACCCAGG CTTTACACTT
961 TATGCTTCCG GCTCGTATAA TGTGTGGATT TTGAGTTAGG ATCCGCGGAG ATTTTCAGGA
1021 GCTAAGGAAG CTAAAATGGA GAAAAAATC ACTGGATATA CCACCGTTGA TATATCCCAA
1081 TGGCATCGTA AAGAACATTT TGAGGCATTT CAGTCAGTTG CTCAATGTAC CTATAACCAG
1141 ACCGTTT CAGC TGGATATTAC GGCCTTTTTTA AAGACCGTAA AGAAAAATAA GCACAAGTTT
1201 TATCCGGCCT TTATTCACAT TCTTGCCCGC CTGATGAATG CTCATCCGGA ATTCCGTATG
1261 GCAATGAAAG ACGGTGAGCT GGTGATATGG GATAGTGTTC ACCCTTGTTA CACCGTTTTT
1321 CATGAGCAAA CTGAAACGTT TTCATCGCTC TGGAGTGAAT ACCACGACGA TTTCCGGCAG
1381 TTTCTACACA TATATTCGCA AGATGTGGCG TGTTACGGTG AAAACCTGGC CTATTTCCCT
1441 AAAGGGTTTA TTGAGAATAT GTTTTTTCGTC TCAGCCAATC CCTGGGTGAG TTTCACCAGT
1501 TTTGATTTAA ACGTGGCCAA TATGGACAAC TTCTTCGCCC CCGTTTTTCAC CATGGGCAAA
1561 TATTATACGC AAGGCGACAA GGTGCTGATG CCGCTGGCGA TTCAGGTTCA TCATGCCGTC
1621 TGTGATGGCT TCCATGTCGG CAGAATGCTT AATGAATTAC AACAGTACTG CGATGAGTGG
1681 CAGGGCGGGG CGTAAAGATC TGGATCCGGC TTACTAAAAG CCAGATAACA GTATGCGTAT
1741 TTGCGCGCTG ATTTTGTGCG TATAAGAATA TATACTGATA TGTATACCCG AAGTATGTCA
1801 AAAAGAGGTG TGCTATGAAG CAGCGTATTA CAGTGACAGT TGACAGCGAC AGCTATCAGT
1861 TGCTCAAGGC ATATATGATG TCAATATCTC CGGTCTGGTA AGCACAACCA TGCAGAATGA
1921 AGCCCGTCTG CTGCGTGCCG AACGCTGGAA AGCGGAAAAT CAGGAAGGGA TGGCTGAGGT
1981 CGCCCGGTTT ATTGAAATGA ACGGCTCTTT TGCTGACGAG AACAGGGACT GGTGAAATGC
2041 AGTTTAAAGT TTACACCTAT AAAAGAGAGA GCCGTTATCG TCTGTTTGTG GATGTACAGA
2101 GTGATATTAT TGACACGCCC GGGCGACGGA TGGTGATCCC CCTGGCCAGT GCACGTCTGC
2161 TGTCAGATAA AGTCTCCCGT GAACTTTACC CCGTGGTGCA TATCGGGGAT GAAAGCTGGC
2221 GCATGATGAC CACCGATATG GCCAGTGTGC CCGTCTCCGT TATCGGGGAA GAAGTGGCTG
2281 ATCTCAGCCA CCGCGAAAAT GACATCAAAA ACGCCATTAA CCTGATGTTT TGGGGAATAT

```

FIGURE 47B

2341 AAATGTCAGG CTCCCTTATA CACAGCCAGT CTGCAGGTCG ACCATAGTGA CTGGATATGT
2401 TGTGTTTTAC AGTATTATGT AGTCTGTTTT TTATGCAAAA TCTAATTTAA TATATTGATA
2461 TTTATATCAT TTTACGTTTC TCGTTCAGCT TTCTTGTACA AAGTGGTTGA TCGCGTGCAT
2521 GCGACGTCAT AGCTCTCTCC CTATAGTGAG TCGTATTATA AGCTAGGCAC TGGCCGTCGT
2581 TTTACAACGT CGTGACTGGG AAAACTGCTA GCTTGGGATC TTTGTGAAGG AACCTTACTT
2641 CTGTGGTGTG ACATAATTGG ACAAACCTACC TACAGAGATT TAAAGCTCTA AGGTAAATAT
2701 AAAATTTTTA AGTGTATAAT GTGTAAACT AGCTGCATAT GCTTGCTGCT TGAGAGTTTT
2761 GCTTACTGAG TATGATTTAT GAAAATATTA TACACAGGAG CTAGTGATTG TAATTGTTTG
2821 TGTATTTTAG ATTACAGTC CCAAGGCTCA TTTCAGGCCC CTCAGTCCTC ACAGTCTGTT
2881 CATGATCATA ATCAGCCATA CCACATTTGT AGAGGTTTTA CTTGCTTTAA AAAACCTCCC
2941 ACACCTCCCC CTGAACCTGA AACATAAAAT GAATGCAATT GTTGTGTGTA ACTTGTTTAT
3001 TGCAGCTTAT AATGGTTACA AATAAAGCAA TAGCATCACA AATTTACAAA ATAAAGCATT
3061 TTTTCACTG CATTCTAGTT GTGGTTTGTC CAAACTCATC AATGTATCTT ATCATGTCTG
3121 GATCGATCCT GCATTAATGA ATCGGCCAAC GCGCGGGGAG AGGCGGTTTG CGTATTGGCT
3181 GGCGTAATAG CGAAGAGGCC CGCACCAGTC GCCCTTCCCA ACAGTTGCGC AGCCTGAATG
3241 GCGAATGGGA CGCGCCCTGT AGCGGCGCAT TAAGCGCGGC GGGTGTGGTG GTTACGCGCA
3301 GCGTGACCGC TACACTTGCC AGCGCCCTAG CGCCCGCTCC TTTCGCTTTC TTCCCTTCCT
3361 TTCTCGCCAC GTTCGCCGCGC TTTCGCCGTC AAGCTCTAAA TCGGGGGCTC CCTTTAGGGT
3421 TCCGATTTAG TGCTTTACGG CACCTCGACC CCAAAAAACT TGATTAGGGT GATGGTTCAC
3481 GTAGTGGGCC ATCGCCCTGA TAGACGGTTT TTCGCCCTTT GACGTTGGAG TCCACGTTCT
3541 TTAATAGTGG ACTCTGTGTC CAACTGGAA CAACACTCAA CCCTATCTCG GTCTATTCTT
3601 TTGATTTATA AGGGATTTTG CCGATTTTCG CCTATTGGTT AAAAAATGAG CTGATTTAAC
3661 AAATATTTAA CGCGAATTTT AACAAAATAT TAACGTTTAC AATTTGCGCT GATGCGGTAT
3721 TTTCTCCTTA CGCATCTGTG CGGTATTTCA CACCGCATAC GCGGATCTGC GCAGCACCAT
3781 GGCCTGAAAT AACCTCTGAA AGAGGAACCT GGTAGGTAC CTTCTGAGGC GGAAGAACC
3841 AGCTGTGGAA TGTGTGTCAG TTAGGTGTG GAAAGTCCCC AGGCTCCCCA GCAGGCAGAA
3901 GTATGCAAAG CATGCATCTC AATTAGTCAG CAACCAGGTG TGGAAAGTCC CCAGGCTCCC
3961 CAGCAGGCAG AAGTATGCAA AGCATGCATC TCAATTAGTC AGCAACCATA GTCCCGCCCC
4021 TAACTCCGCC CATCCCGCCC CTAACTCCGC CCAGTTCCGC CCATTCTCCG CCCCATGGCT
4081 GACTAATTTT TTTTATTTAT GCAGAGGCCG AGGCCGCCTC GGCTCTGAG CTATTCCAGA
4141 AGTAGTGAGG AGGCTTTTTT GGAGGCCTAG GCTTTTGCAA AAAGCTTGAT TCTTCTGACA
4201 CAACAGTCTC GAACCTAAGG CTAGAGCCAC CATGATTGAA CAAGATGGAT TGCACGCAGG
4261 TTCTCCGGCC GCTTGGGTGG AGAGGCTATT CGGCTATGAC TGGGCACAA AGACAATCGG
4321 CTGCTCTGAT GCCGCCGTGT TCCGGCTGTC AGCGCAGGGG CGCCCGGTTT TTTTGTCAA
4381 GACCGACCTG TCCGGTGCCC TGAATGAACT GCAGGACGAG GCAGCGCGC TATCGTGGCT
4441 GGCCACGACG GCGCTTCCTT GCGCAGCTGT GCTCGACGTT GTCAGTGAAG CGGGAAGGGA
4501 CTGGCTGCTA TTGGGCGAAG TGCCGGGGCA GGATCTCCTG TCATCTCACC TTGCTCCTGC
4561 CGAGAAAGTA TCCATCATGG CTGATGCAAT GCGGCGGCTG CATACGCTTG ATCCGGCTAC
4621 CTGCCCATTC GACCACCAAG CGAAACATCG CATCGAGCGA GCACGTACTC GGATGGAAGC
4681 CGGTCTTGTC GATCAGGATG ATCTGGACGA AGAGCATCAG GGGCTCGCGC CAGCCGAAC
4741 GTTCGCCAGG CTCAAGGCGC GCATGCCCGA CGGCGAGGAT CTCGTCGTGA CCCATGGCGA
4801 TGCCTGCTTG CCGAATATCA TGGTGGAATA TGGCCGCTT TCTGGATTCA TCGACTGTGG
4861 CCGGCTGGGT GTGGCGGACC GCTATCAGGA CATAGCGTTG GCTACCCGTG ATATTGCTGA
4921 AGAGCTTGGC GCGAATGGG CTGACCGCTT CCTCGTGCTT TACGGTATCG CCGCTCCCGA
4981 TTCGCAGCGC ATCGCCTTCT ATCGCCTTCT TGACGAGTTC TTCTGAGCGG GACTCTGGGG
5041 TTCGAAATGA CCGACCAAGC GACGCCAAC CTGCCATCAC GATGGCCGCA ATAAAAATATC
5101 TTTATTTTCA TTACATCTGT GTGTTGGTTT TTTGTGTGAA TCGATAGCGA TAAGGATCCG
5161 CGTATGGTGC ACTCTCAGTA CAATCTGCTC TGATGCCGCA TAGTTAAGCC AGCCCCGACA
5221 CCGGCCAACA CCCGCTGACG CGCCCTGACG GGCTTGCTCTG CTCCCGGCAT CCGCTTACAG
5281 ACAAGCTGTG ACCGTCTCCG GGAGCTGCAT GTGTCAGAGG TTTTCACCGT CATCACCAGG
5341 ACGCGCGAGA CGAAAGGGCC TCGTGATACG CCTATTTTTA TAGGTTAATG TCATGATAAT
5401 AATGGTTTTCT TAGACGTCAG GTGGCACTTT TCGGGGAAAT GTGCGCGGAA CCCCTATTTG
5461 TTTATTTTTT TAAATACATT CAAATATGTA TCCGCTCATG AGACAATAAC CCTGATAAAT
5521 GCTTCAATAA TATTGAAAAA GGAAGAGTAT GAGTATTCAA CATTTCCTGT TCGCCCTTAT
5581 TCCCTTTTTT GCGGCATTTT GCCTTCCTGT TTTTGCTCAC CCAGAAACGC TGGTGAAAGT
5641 AAAAGATGCT GAAGATCAGT TGGGTGCACG AGTGGGTTAC ATCGAACTGG ATCTCAACAG
5701 CGGTAAGATC CTTGAGAGTT TTCGCCCCGA AGAACGTTTT CCAATGATGA GCACTTTTAA
5761 AGTTCTGCTA TGTGGCGCGG TATTATCCCC TATTGACGCC GGGCAAGAGC AACTCGGTGCG -

FIGURE 47C

Figure 48 A: pEXP501: pCMV.SPORT 6 host for attB Libraries

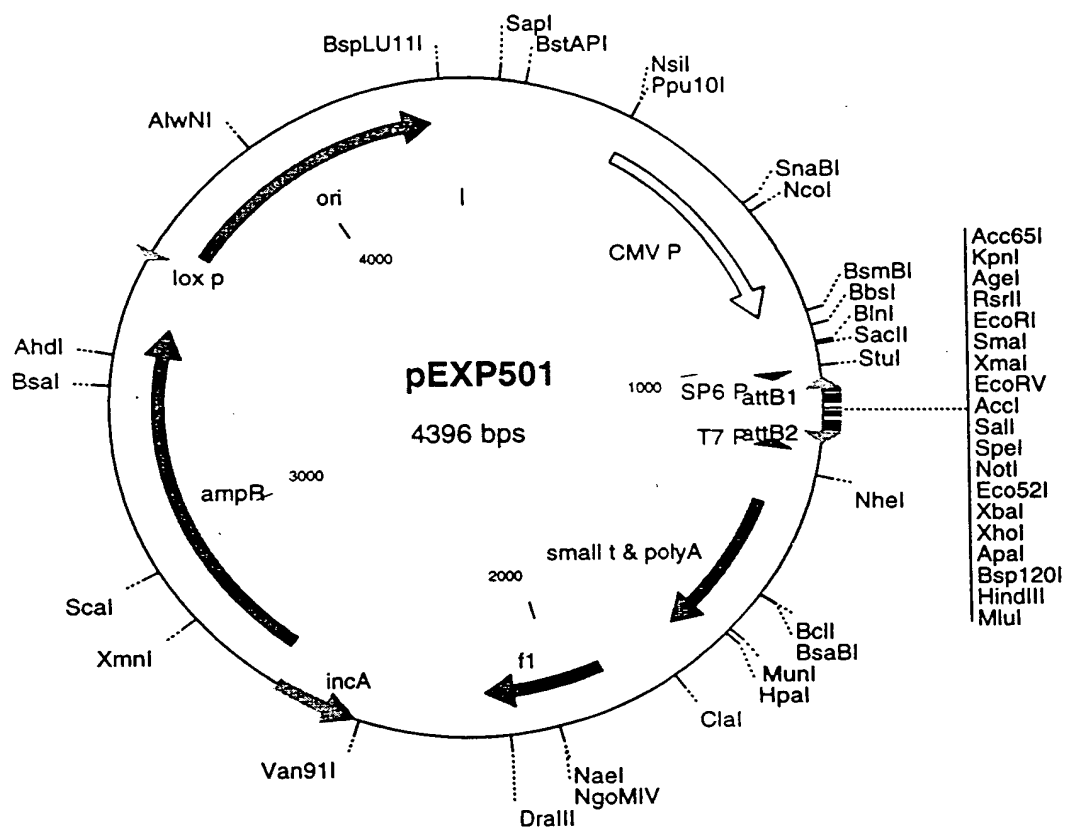


Figure 48B: pEXP501 (cont'd). **Features of the att B cloning vector, pEXP501.** Bases within hatched area are replaced by cDNA in some LTI cDNA libraries.

868
 ---aga gct cgt tta gtg aac cgt cag atc gcc tgg aga cgc cat cca
 ---tct cga gca aat cac ttg gca gtc tag cgg acc tct gcg gta ggt

cgc tgt ttt gac ctc cat aga aga cac cgg gac cga tcc agc ctc
 gcg aca aaa ctg gag gta tct tct gtg gcc ctg gct agg tct gag

Sst I LTI rev primer
 cgg act cta gcc tag gcc gag cgg ata aca att tca cac agg
 gcc tga gat cgg atc cgg cgc ctc gcc tat tgt taa agt gtg tcc

ABE rev primer Sph SP6 promoter SP6
 aaa cag cta tga cca tta ggc cta ttt agg tga cac tat aga aca
 ttt gtc gat act ggt aat ccg gat aaa tcc act gtg ata tct tgt

Int att B 1 Age Kpn Rsr II EcoRI Sma
 agt ttg tac aaa aaa gca ggc tgg tac cgg tcc gga att ccc ggg
 tca aac atg ttt ttt cgt ccg atc atg gcc agt cct taa ggg ccc

EcoRI Sal Spe Not Xba
 att tcc ttc agc tta tta gtc ggc ggc cgc tct aga gta tcc
 tat agc agc ttc tgc agt gat cag ccg ccg ggc aga tct cat agg

Xba Acl I Hind III Mlu att B 2 Int
 dtc gag ggg cgt agc ctt acg cgt acc cag ctt tct tgt aca aag
 gag ctc ccc ggg ttc gaa tgc gaa tgg gtc gaa aga aca tgt ttc

Egg tcc cta tag tga gtc gta tta taa gct agg cac tgg ccg tct
 acc agg gat atc act cag cat aat att cga tcc gtg acc ggc agc
 T1 T1 promoter ABE fwd

Nhe 1272
 ttt tac aac gtc gtg act ggg aaa act cct agc ttg gga tct ttg---
 aaa atg ttg cag cac tga ccc ttt tga cga tgg aac cct aga aac---
 LTI fwd

00000 00000 00000

pEXP501 4396 bp

1 CCATTGCGCCA TTCAGGCTGC GCAACTGTTG GGAAGGGCGA TCGGTGCGGG CCTCTTCGCT
61 ATTACGCCAG CCAATACGCA AACCGCCTCT CCCCgcgcgt TGGCCGATTC ATTAATGCAG
121 GATCGATCCA GACATGATAA GATACATTGA TGAGTTTGGA CAAACCACAA CTAGAATGCA
181 GTGAAAAAAA TGCTTTATTT GTGAAATTTG TGATGCTATT GCTTTATTTG TAACCATTAT
241 AAGCTGCAAT AAACAAGTTA ACAACAACAA TTGCATTCAT TTTATGTTTC AGGTTTCAGGG
301 GGAGGTGTGG GAGGTTTTTT AAAGCAAGTA AAACCTCTAC AAATGTGGTA TGGCTGATTA
361 TGATCATGAA CAGACTGTGA GGACTGAGGG GCCTGAAATG AGCCTTGGGA CTGTGAATCT
421 AAAATACACA AACAATTAGA ATCAGTAGCT CCTGTGTATA ATATTTTCAT AAATCATACT
481 CAGTAAGCAA AACTCTCAAG CAGCAAGCAT ATGCAGCTAG TTTAACACAT TATACACTTA
541 AAAATTTTAT ATTTACCTTA GAGCTTTAAA TCTCTGTAGG TAGTTTGTCC AATTATGTCA
601 CACCACAGAA GTAAGGTTCC TTCACAAAGA TCCAAGCTA GCAGTTTCC CAGTCACGAC
661 GTTGTAAGAC GACGGCCAGT GCCTAGCTTA TAATACGACT CACTATAGGG ACCACTTTGT
721 ACAAGAAAGC TGGGTACGCG TAAGCTTGGG CCCCTCGAGG GATCCTCTAG AGCGGCCGCC
781 GACTAGTGAG CTCGTCGACG ATATCCCGGG AATTCCGGAC CGGTACCAGC CTGCTTTTTT
841 GTACAAACTT GTTCTATAGT GTCACCTAAA TAGGCCTAAT GGTCATAGCT GTTTCCTGTG
901 TGAAATTGTT ATCCGCTCCG CGGCCTAGGC TAGAGTCCGG AGGCTGGATC GGTCCCGGTG
961 TCTTCTATGG AGGTCAAAC AGCGTGGATG GCGTCTCCAG GCGATCTGAC GGTTCATAA
1021 ACGAGCTCTG CTTATATAGA CCTCCCACCG TACACGCCTA CCGCCCATTT GCGCAATGG
1081 GGCGGAGTTG TTACGACATT TTGGAAAGTC CCGTTGATTT TGGTGCCAAA ACAAACTCCC
1141 ATTGACGTCA ATGGGGTGGA GACTTGGAAT TCCCGTGAG TCAAACCGCT ATCCACGCCC
1201 ATTGATGTAC TGCCAAAACC GCATCACCAT GGTAATAGCG ATGACTAATA CGTAGATGTA
1261 CTGCCAAGTA GGAAAGTCCC ATAAGGTCAT GTACTGGGCA TAATGCCAGG CGGGCCATTT
1321 ACCGTCATTG ACGTCAATAG GGGGCGTACT TGGCATATGA TACTTTGAT GTACTGCCAA
1381 GTGGGCAGTT TACCGTAAAT ACTCCACCCA TTGACGTCAA TGGAAAGTCC CTATTGGCGT
1441 TACTATGGGA ACATACGTCA TTATTGACGT CAATGGGCGG GGGTCGTTGG GCGGTCAGCC
1501 AGGCGGGCCA TTTACCGTAA GTTATGTAAC GACATGCATC TAATGAGTGA AAGGGCCTCG
1561 TACTACGCCT ATTTTATAG GTTAATGTCA TGATAATAAT GGTTTCTTAG ACGTCAGGTG
1621 GCACTTTTCG GGGAAATGTG CGCGGAACCC CTATTTGTTT ATTTTCTAA ATACATTCAA
1681 ATATGTATCC GCTCATGAGA CAATAACCC TATAAATGCT TCAATAATAT TGAACACGC
1741 GCGAATTGCA AGCTCTGCAT TAATGAATCG GCCAACGCGC GGGGAGAGGC GGTTCGCTA
1801 TTGGGCGCTC TTCCGCTTCC TCGCTCACTG ACTCGCTGCG CTCGGTCGTT CGGTCGCGC
1861 GAGCGGTATC AGCTCACTCA AAGGCGGTAA TACGGTTATC CACAGAATCA GGGGATAACG
1921 CAGGAAAGAA CATGTGAGCA AAAGGCCAGC AAAAGGCCAG GAACCGTAAA AAGGCCGCGT
1981 TGCTGGCGTT TTTCCATAGG CTCCGCCCCC CTGACGAGCA TCACAAAAAT CGACGCTCAA
2041 GTCAGAGGTG GCGAAACCCG ACAGGACTAT AAAGATACCA GCGGTTTCCC CCTGGAAGCT
2101 CCCTCGTGCG CTCTCCTGTT CCGACCCTGC CGCTTACCGG ATACCTGTCC GCCTTCTCC
2161 CTTGCGGAAG CGTGCGGCTT TCTCAATGCT CACGCTGTAG GTATCTCAGT TCGGTGTAGG
2221 TCGTTTCGTC CAAGCTGGGC TGTGTGCACG ACCCCCGCT TCAGCCCGAC CGCTGCGCCT
2281 TATCCGGTAA CTATCGTCTT GAGTCCAACC CGGTAAGACA CGACTTATCG CCACTGGCAG
2341 CAGCCACTGG TAACAGGATT AGCAGAGCGA GGTATGTAGG CGGTGCTACA GAGTTCCTGA
2401 AGTGGTGGCC TAACACGGC TACACTAGAA GGACAGTATT TGGTATCTGC GCTCTGCTGA
2461 AGCCAGTTAC CTTGCGAAAA AGAGTTGGTA GCTCTTGATC CGGCAAACAA ACCACCGCTG
2521 GTAGCGGTGG TTTTTTTGTT TGCAAGCAGC AGATTACGCG CAGAAAAAAA GGATCTCAAG
2581 AAGATCCTTT GATCTTTTCT ACGGGGTCTG ACGCTCAGTG GAACGAAAC TCACGTTAAG
2641 GGATTTTGGT CATGCCATAA CTTTCGTATAG CATAACATTAT ACGAAGTTAT GGCATGAGAT
2701 TATCAAAAAG GATCTTCACC TAGATCCTTT TAAATTAAAA ATGAAGTTTT AAATCAATCT
2761 AAAGTATATA TGAGTAAACT TGGTCTGACA GTTACCAATG CTTAATCAGT GAGGCACCTA
2821 TCTCAGCGAT CTGTCTATTT CGTTCATCCA TAGTTGCCTG ACTCCCCGTC GTGTAGATAA
2881 CTACGATACG GGAGGGCTTA CCATCTGGCC CCAGTGCTGC AATGATACCG CGAGACCCAC
2941 GCTCACCAGC TCCAGATTTA TCAGCAATAA ACCAGCCAGC CGGAAGGGCC GAGCGCAGAA
3001 GTGGTCCTGC AACTTTATCC GCCTCCATCC AGTCTATTAA TTGTTGCCGG GAAGCTAGAG
3061 TAAGTAGTTC GCCAGTTAAT AGTTTGCACA ACGTTGTTGC CATTGCTACA GGCATCGTGG
3121 TGTCACGCTC GTCGTTTGGT ATGGCTTCAT TCAGCTCCGG TTCCAACGA TCAAGGCGAG-

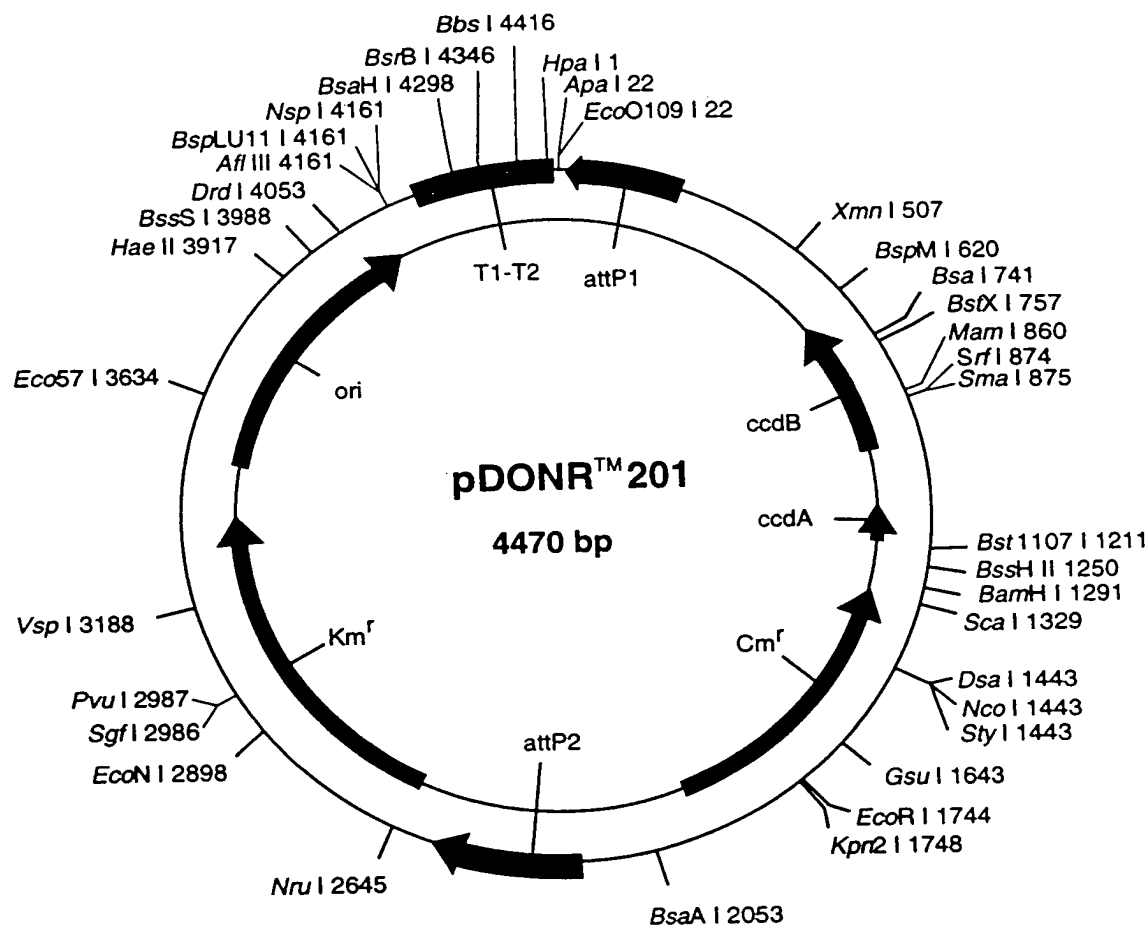
Figure 48c

3181 TTACATGATC CCCCATGTTG TGCAAAAAAG CGGTTAGCTC CTTTCGGTCCT CCGATCGTTG
 3241 TCAGAAGTAA GTTGGCCGCA GTGTTATCAC TCATGGTTAT GGCAGCACTG CATAATTCTC
 3301 TTACTGTCAT GCCATCCGTA AGATGCTTTT CTGTGACTGG TGAGTACTCA ACCAAGTCAT
 3361 TCTGAGAATA GTGTATGCGG CGACCGAGTT GCTCTTGCCC GCGTCAATA CGGGATAATA
 3421 CCGCGCCACA TAGCAGAACT TTAAAAGTGC TCATCATTGG AAAACGTTCT TCGGGGCGAA
 3481 AACTCTCAAG GATCTTACCG CTGTTGAGAT CCAGTTCGAT GTAACCCACT CGTGCACCCA
 3541 ACTGATCTTC AGCATCTTTT ACTTTCACCA GCGTTTCTGG GTGAGCAAAA ACAGGAAGGC
 3601 AAAATGCCGC AAAAAAGGGA ATAAGGGCGA CACGGAAATG TTGAATACTC ATACTCTTCC
 3661 TTTTTCATAA TTATTGAAGC ATTTATCAGG GTTATTGTCT CATGCCAGGG GTGGGCACAC
 3721 ATATTTGATA CCAGCGATCC CTACACAGCA CATAATTCAA TGCGACTTCC CTCTATCGCA
 3781 CATCTTAGAC CTTTATTCTC CCTCCAGCAC ACATCGAAGC TGCCGAGCAA GCCGTTCTCA
 3841 CCAAGTCCAAG ACCTGGCATG AGCGGATACA TATTTGAATG TATTTAGAAA AATAAACAAA
 3901 TAGGGGTTCC GCGCACATTT CCCCAGAAAAG TGCCACCTGA AATTGTAAAC GTTAATATTT
 3961 TGTAAAAATT CGCGTTAAAT TTTTGTAAAA TCAGCTCAT TTTTAACCAA TAGGCCGAAA
 4021 TCGGCAAAAT CCCTTATAAA TCAAAGAAT AGACCGAGAT AGGGTTGAGT GTTGTTCAG
 4081 TTTGGAACAA GAGTCCACTA TTAAAGAACG TGGACTCCAA CGTCAAAGGG CGAAAAACCG
 4141 TCTATCAGGG CGATGGCCCA CTACGTGAAC CATCACCCTA ATCAAGTTTT TTGGGGTCGA
 4201 GGTGCCGTAA AGCACTAAAT CGGAACCCTA AAGGGAGCCC CCGATTTAGA GCTTGACGGG
 4261 GAAAGCCGGC GAACGTGGCG AGAAAGGAAG GGAAGAAAGC GAAAGGAGCG GGCGCTAGGG
 4321 CGCTGGCAAG TGTAGCGGTC ACGCTGCGCG TAACCACCAC ACCCGCCGCG CTTAATGCGC
 4381 CGCTACAGGG CGCGTC

FIGURE 48D

Figure 49A

● DONR201 (kanR)



pDONR201 4470 bp (rotated to position 3516)

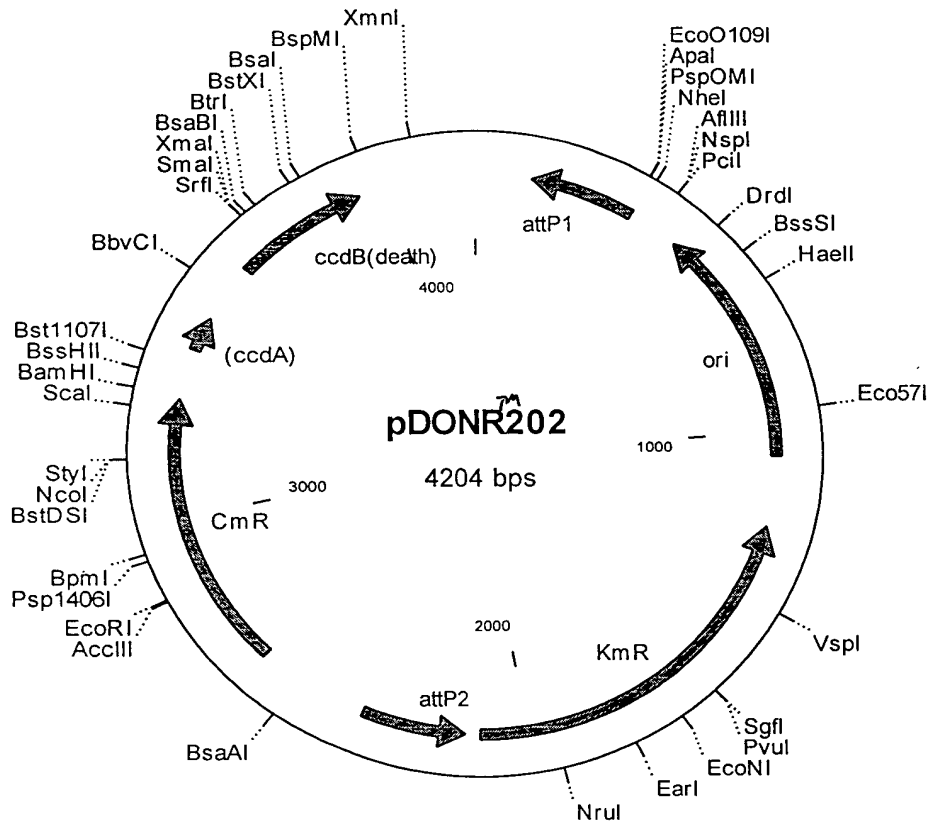
<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
260..29	attP1
656..961	ccdB
1099..1184	ccdA
1303..1962	CmR
2210..2442	attP2
2565..3374	Kmr
3495..4134	ori

```

1 GTTAACGCTA GCATGGATCT CGGGCCCCAA ATAATGATTT TATTTTGGACT GATAGTGACC
61 TGTTTCGTTGC AACAAATTGA TGAGCAATGC TTTTATATAA TGCCAACCTTT GTACAAAAAA
121 GCTGAACGAG AACCGTAAAA TGATATAAAT ATCAATATAT TAAATTAGAT TTTGCATAAA
181 AAACAGACTA CATAAATACTG TAAACACAA CATATCCAGT CACTATGAAT CAACTACTTA
241 GATGGTATTA GTGACCTGTA GTCGACCGAC AGCCTTCCAA ATGTTCTTCG GGTGATGCTG
301 CCAACTTAGT CGACCGACAG CCTTCCAAAT GTTCTTCTCA AACGGAATCG TCGTATCCAG
361 CCTACTCGCT ATTGTCCTCA ATGCCGTATT AAATCATAAA AAGAAATAAG AAAAAGAGGT
421 GCGAGCCTCT TTTTGTGTG ACAAATAAAA AACATCTACC TATTCATATA CGTAGTGTC
481 ATAGTCCTGA AAATCATCTG CATCAAGAAC AATTTACAA CTCTATACT TTTCTCTTAC
541 AAGTCGTTTC GCTTCATCTG GATTTTCAGC CTCTATACT ACTAAACGTG ATAAAGTTTC
601 TGTAATTTCT ACTGTATCGA CCTGCAGACT GGCTGTGTAT AAGGGAGCCT GACATTTATA
661 TTCCCCAGAA CATCAGGTGA ATGGCGTTTT TGATGTCATT TTCGCGGTGG CTGAGATCAG
721 CCACTTCTTC CCCGATAACG GAGACCGGCA CACTGGCCAT ATCGGTGGTC ATCATGCGCC
781 AGCTTTCATC CCCGATATGC ACCACCGGGT AAAGTTCACG GGAGACTTTA TCTGACAGCA
841 GACGTGCACT GGCCAGGGGG ATCACCATCC GTCGCCCCGG CGTGTCAATA ATATCACTCT
901 GTACATCCAC AAACAGACGA TAACGGCTCT CTCTTTTATA GGTGTAAACC TTAACTGCA
961 TTTCAACAGT CCCTGTTCTC GTCAGCAAAA GAGCCGTTCA TTTCAATAAA CCGGGCGACC
1021 TCAGCCATCC CTTCTGTGAT TTCCGCTTTC CAGCGTTCGG CACGCAGACG ACGGGCTTCA
1081 TTCTGCATGG TTGTGCTTAC CAGACCGGAG ATATTGACAT CATATATGCC TTGAGCAACT
1141 GATAGCTGTC GCTGTCAACT GTCACTGTAA TACGCTGCTT CATAGCACAC CTCTTTTGA
1201 CATACTTCGG GTATACATAT CAGTATATAT TCTTATACCG CAAAAATCAG CGCGCAAATA
1261 CGCATACTGT TATCTGGCTT TTAGTAAGCC GGATCCACGC GATTACGCCC CGCCCTGCCA
1321 CTCATCGCAG TACTGTTGTA ATTCAATTAAG CATTCTGCCG ACATGGAAGC CATCACAGAC
1381 GGCATGATGA ACCTGAATCG CCAGCGGCAT CAGCACCTTG TCGCCTTGCG TATAATATTT
1441 GCCCATGGTG AAAACGGGGG CGAAGAAGTT GTCCATATTG GCCACGTTTA AATCAAACT
1501 GGTGAAACTC ACCCAGGGAT TGGCTGAGAC GAAAAACATA TTCTCAATAA ACCCTTTAGG
1561 GAAATAGGCC AGGTTTTTAC CGTAACACGC CACATCTTGC GAATATATGT GTAGAACTG
1621 CCGGAAATCG TCGTGGTATT CACTCCAGAG CGATGAAAAC GTTTCAGTTT GCTCATGGAA
1681 AACGGTGTA CAAGGGTGAA CACTATCCCA TATCACCAGC TCACCGTCTT TCATTGCCAT
1741 ACGGAATTCC GGATGAGCAT TCATCAGGCG GGCAAGAATG TGAATAAAGG CCGGATAAAA
1801 CTTGTGCTTA TTTTCTTTA CCGTCTTTAA AAAGGCCGTA ATATCCAGCT GAACGGTCTG
1861 GTTATAGGTA CATTGAGCAA CTGACTGAAA TGCCCTCAAAA TGTTCTTTAC GATGCCATTG
1921 GGATATATCA ACGGTGGTAT ATCCAGTGAT TTTTCTCTCC ATTTTAGCTT CTTAGCTCC
1981 TGAAAATCTC GATAACTCAA AAAATACGCC CGGTAGTGAT CTTATTTTAT TATGGTGAAA
2041 GTTGGAACCT CTTACGTGCC GATCAACGTC TCATTTTCGC CAAAAGTTGG CCCAGGGCTT
2101 CCCGGTATCA ACAGGGACAC CAGGATTTAT TTATTCTGCG AAGTGATCTT CCGTCACAGG
2161 TATTTATTTC GCGCAAAGTG CGTCGGGTGA TGCTGCCAAC TTAGTCGACT ACAGGTCACT
2221 AATACCATCT AAGTAGTTGA TTCATAGTGA CTGGATATGT TGTGTTTAC AGTATTATGT
2281 AGTCTGTTTT TTATGCAAAA TCTAATTTAA TATATTGATA TTTATATCAT TTTACGTTTC
2341 TCGTTCAGCT TTCTTGTA AAGTTGGCAT TATAAGAAAG CATTGCTTAT CAATTTGTTG
2401 CAACGAACAG GTCACATATCA GTCAAAATAA AATCATTATT TGCCATCCAG CTGCAGCTCT
2461 GGCCCGTGTG TCAAAATCTC TGATGTTACA TTGCACAAGA TAAATATA TCATCATGAA
2521 CAATAAACT GTCTGCTTAC ATAAACAGTA ATACAAGGGG TGTTATGAGC CATATTCAAC
2581 GGGAAACGTC GAGGCCGCGA TTAAATTCCA ACATGGATGC TGATTTATAT GGTATATAAT
2641 GGGCTCGCGA TAATGTCGGG CAATCAGGTG CGACAATCTA TCGCTTGAT GGAAGCCCCG
2701 ATGCGCCAGA GTTGTCTCTG AAACATGGCA AAGGTAGCGT TGCCAATGAT GTTACAGATG -

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FIGURE 49B

[illegible]

pDONR202 4204 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
369..127	attP1
486..1059	ori
1228..2107	KmR
2381..2140	attP2
2629..3288	CmR
3408..3492	inactivated ccdA
3630..3935	ccdB

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1 CGGCATTGAG GACAATAGCG AGTAGGCTGG ATACGACGAT TCCGTTTGAG AAGAACATTT
61 GGAAGGCTGT CGGTCGACTA AGTTGGCAGC ATCACCCGAA GAACATTTGG AAGGCTGTCTG
121 GTCGACTACA GGTCACTAAT ACCATCTAAG TAGTTGATTC ATAGTGACTG GATATGTTGT
181 GTTTTACAGT ATTATGTAGT CTGTTTTTTA TGCAAAATCT AATTTAATAT ATTGATATTT
241 ATATCATTTT ACGTTTCTCG TTCAGCTTTT TTGTACAAAG TTGGCATTAT AAAAAAGCAT
301 TGCTCATCAA TTTGTTGCAA CGAACAGGTC ACTATCAGTC AAAATAAAAT CATTATTTGG
361 GGCCCGAGAT CCATGCTAGC GGTAATACGG TTATCCACAG AATCAGGGGA TAACGCAGGA
421 AAGAACATGT GAGCAAAAGG CCAGCAAAAG GCCAGGAACC GTAAAAAGGC CGCGTTGCTG
481 GCGTTTTTCC ATAGGCTCCG CCCCCCTGAC GAGCATCACA AAAATCGACG CTCAAGTCAG
541 AGGTGGCGAA ACCCGACAGG ACTATAAAGA TACCAGGCGT TTCCCCCTGG AAGCTCCCCTC
601 GTGCGCTCTC CTGTTCCGAC CCTGCCGCTT ACCGGATACC TGTCCGCCTT TCTCCCTTCG
661 GGAAGCGTGG CGCTTTCTCA TAGCTCACGC TGTAGGTATC TCAGTTCGGT GTAGGTCGTT
721 CGCTCCAAGC TGGGCTGTGT GCACGAACCC CCCGTTTCAG CCGACCGCTG CGCCTTATCC
781 GGTAACATATC GTCTTGAGTC CAACCCGGTA AGACACGACT TATCGCCACT GGCAGCAGCC
841 ACTGGTAACA GGATTAGCAG AGCGAGGTAT GTAGGCGGTG CTACAGAGTT CTTGAAGTGG
901 TGGCCTAACT ACGGCTACAC TAGAAGGACA GTATTTGGTA TCTGCGCTCT GCTGAAGCCA
961 GTTACCTTCG GAAAAAGAGT TGGTAGCTCT TGATCCGGCA AACAAACCAC CGCTGGTAGC
1021 GGTGGTTTTT TTGTTTGCAA GCAGCAGATT ACGCGCAGAA AAAAAGGATC TCAAGAAGAT
1081 CCTTTGATCT TTTCTACGGG GTCTGACGCT CAGTGAACG AAAACTCAGC TTAAGGGATT
1141 TTGGTCATGA GCTTGCGCCG TCCCGTCAAG TCAGCGTAAT GCTCTGCCAG TGTTACAACC
1201 AATTAACCAA TTCTGATTAG AAAAATCAT CGAGCATCAA ATGAAACTGC AATTTATTCA
1261 TATCAGGATT ATCAATACCA TATTTTTGAA AAAGCCGTTT CTGTAATGAA GGAGAAAATC
1321 CACCGAGGCA GTTCCATAGG ATGGCAAGAT CCTGGTATCG GTCTGCGATT CCGACTCGTC
1381 CAACATCAAT ACAACCTATT AATTTCCCCT CGTCAAAAAT AAGGTTATCA AGTGAGAAAT
1441 CACCATGAGT GACGACTGAA TCCGGTGAGA ATGGCAAAAG TTTATGCATT TCTTTCCAGA
1501 CTTGTTCAAC AGGCCAGCCA TTACGCTCGT CATCAAAATC ACTCGCATCA ACCAAACCGT
1561 TATTCATTCT TGATTGCGCC TGAGCGAGAC GAAATACGCG ATCGCTGTTA AAAGGACAAT
1621 TACAAACAGG AATCGAATGC AACC GGCGCA GGAACACTGC CAGCGCATCA ACAATATTTT
1681 CACCTGAATC AGGATATTCT TCTAATACCT GGAATGCTGT TTTTCCGGGG ATCGCAGTGG
1741 TGAGTAACCA TGCATCATCA GGAGTACGGA TAAAATGCTT GATGGTCGGA AGAGGCATAA
1801 ATTCCGTCAG CCAGTTTAGT CTGACCATCT CATCTGTAAC ATCATTGGCA ACGCTACCTT
1861 TGCCATGTTT CAGAAACAAC TCTGGCGCAT CGGGCTTCCC ATACAAGCGA TAGATTGTCTG
1921 CACCTGATTG CCCGACATTA TCGCGAGCCC ATTTATACCC ATATAAATCA GCATCCATGT
1981 TGGAATTTAA TCGCGGCCTC GACGTTTCCC GTTGAATATG GCTCATAACA CCCCTTGAT
2041 TACTGTTTAT GTAAGCAGAC AGTTTTATTG TTCATGATGA TATATTTTTA TCTTGTGCAA
2101 TGTAACATCA GAGATTTTGA GACACGGGCC AGAGCTGCAG CTGGATGGCA AATAATGATT
2161 TTATTTTGAC TGATAGTGAC CTGTTTCGTTG CAACAAATTG ATAAGCAATG CTTTCTTATA
2221 ATGCCAACTT TGTACAAGAA AGCTGAACGA GAAACGTAAA ATGATATAAA TATCAATATA
2281 TTAAATTAGA TTTTGCATAA AAAACAGACT ACATAATACT GTAAAACACA ACATATCCAG
2341 TCACTATGAA TCAACTACTT AGATGGTATT AGTGACCTGT AGTCGACTAA GTTGGCAGCA
2401 TCACCCGACG CACTTTGCGC CGAATAAATA CCTGTGACGG AAGATCACTT CGCAGAATAA
2461 ATAAATCCTG GTGTCCCTGT TGATACCGGG AAGCCCTGGG CCAACTTTTG GCGAAAATGA
2521 GACGTTGATC GGCACGTAAG AGGTTCCAAC TTTACCATA ATGAAATAAG ATCACTACCG
2581 GCGGTATTTT TTGAGTTATC GAGATTTTCA GGAGCTAAGG AAGCTAAAAT GGAGAAAAAA
2641 ATCACTGGAT ATACCACCGT TGATATATCC CAATGGCATC GTAAAGAACA TTTTGAGGCA
2701 TTTCAGTCAG TTGCTCAATG TACCTATAAC CAGACCGTTC AGCTGGATAT TACGGCCTTT

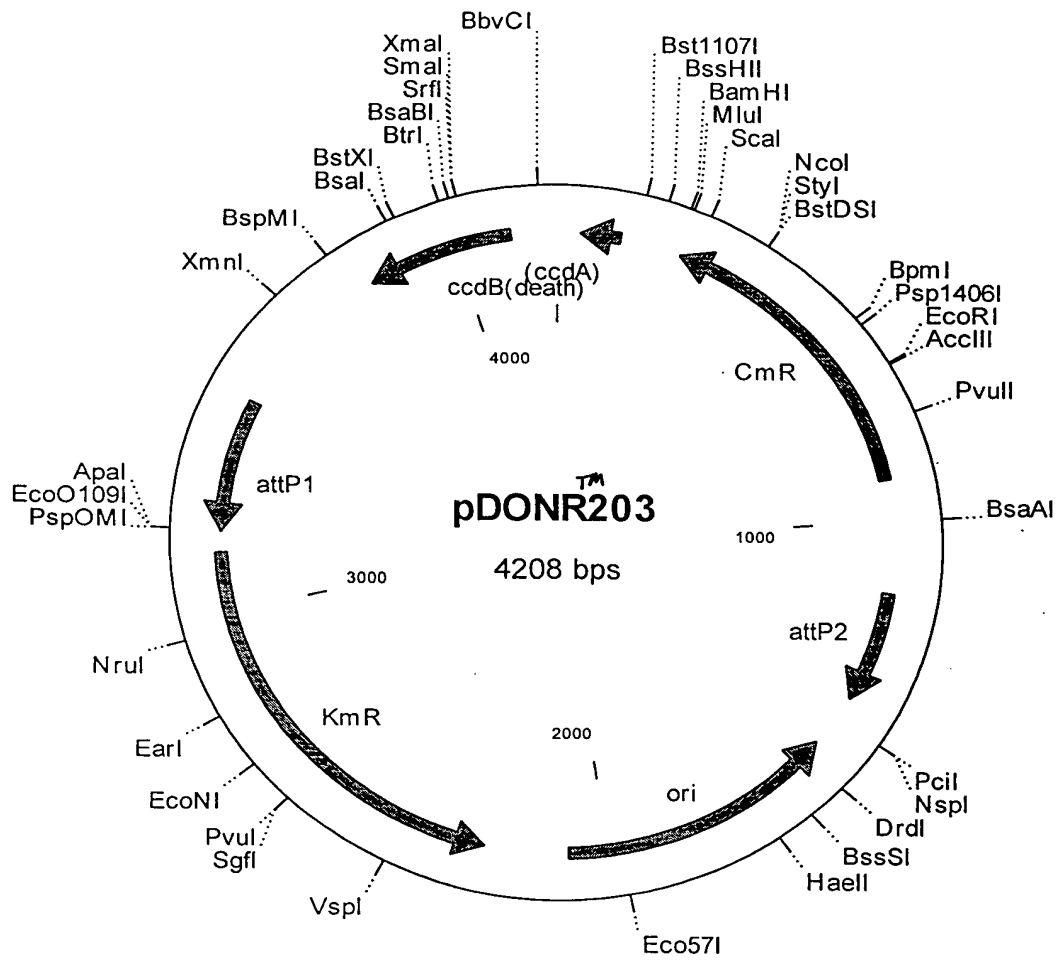
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Figure 50B

2761	TTAAAGACCG	TAAAGAAAAA	TAAGCACAAG	TTTTATCCGG	CCTTTATTCA	CATTCTTGCC
2821	CGCCTGATGA	ATGCTCATCC	GGAATTCCGT	ATGGCAATGA	AAGACGGTGA	GCTGGTGATA
2881	TGGGATAGTG	TTCACCTTG	TTACACCGTT	TTCCATGAGC	AAACTGAAAC	GTTTTCATCG
2941	CTCTGGAGTG	AATACCACGA	CGATTTCCGG	CAGTTTCTAC	ACATATATTC	GCAAGATGTG
3001	GCGTGTTACG	GTGAAAACCT	GGCCTATTTT	CCTAAAGGGT	TTATTGAGAA	TATGTTTTTC
3061	GTCTCAGCCA	ATCCCTGGGT	GAGTTTCACC	AGTTTTGATT	TAAACGTGGC	CAATATGGAC
3121	AACTTCTTCG	CCCCCGTTTT	CACCATGGGC	AAATATTATA	CGCAAGGCGA	CAAGGTGCTG
3181	ATGCCGCTGG	CGATTTCAGG	TCATCATGCC	GTCTGTGATG	GCTTCCATGT	CGGCAGAATG
3241	CTTAATGAAT	TACAACAGTA	CTGCGATGAG	TGGCAGGGCG	GGGCGTAATC	GCGTGGATCC
3301	GGCTTACTAA	AAGCCAGATA	ACAGTATGCG	TATTTGCGCG	CTGATTTTTG	CGGTATAAGA
3361	ATATATACTG	ATATGTATAC	CCGAAGTATG	TCAAAAAGAG	GTGTGCTATG	AAGCAGCGTA
3421	TTACAGTGAC	AGTTGACAGC	GACAGCTATC	AGTTGCTCAA	GGCATATATG	ATGTCAATAT
3481	CTCCGGTCTG	GTAAGCACAA	CCATGCAGAA	TGAAGCCCGT	CGTCTGCGTG	CCGAACGCTG
3541	GAAAGCGGAA	AATCAGGAAG	GGATGGCTGA	GGTCGCCCCG	TTTATTGAAA	TGAACGGCTC
3601	TTTTTGCTGAC	GAGAACAGGG	ACTGGTGAAA	TGCAGTTTAA	GGTTTACACC	TATAAAAAGAG
3661	AGAGCCGTTA	TCGTCTGTTT	GTGGATGTAC	AGAGTGATAT	TATTGACACG	CCCGGGCGAC
3721	GGATGGTGAT	CCCCCTGGCC	AGTGCACGTC	TGCTGTCAGA	TAAAGTCTCC	CGTGAACTTT
3781	ACCCGGTGGT	GCATATCGGG	GATGAAAGCT	GGCGCATGAT	GACCACCGAT	ATGGCCAGTG
3841	TGCCGGTCTC	CGTTATCGGG	GAAGAAGTGG	CTGATCTCAG	CCACCGCGAA	AATGACATCA
3901	AAAACGCCAT	TAACCTGATG	TTCTGGGGAA	TATAAATGTC	AGGCTCCCTT	ATACACAGCC
3961	AGTCTGCAGG	TCGATACAGT	AGAAATTACA	GAAACTTTAT	CACGTTTAGT	AAGTATAGAG
4021	GCTGAAAATC	CAGATGAAGC	CGAACGACTT	GTAAGAGAAA	AGTATAAGAG	TTGTGAAATT
4081	GTTCTTGATG	CAGATGATTT	TCAGGACTAT	GACACTAGCG	TATATGAATA	GGTAGATGTT
4141	TTTATTTTGT	CACACAAAAA	AGAGGCTCGC	ACCTCTTTTT	CTTATTTCTT	TTTATGATTT
4201	AATA					

FIGURE 50C

FIGURE 514 pDONR203 (kan^R)



002000-00427350

pDONR203 4208 bp

Location (Base Nos.)

47..131
251..910
1158..1398
1509..2082
2251..3130
3464..3174
3812..4117

Gene Encoded

inactivated ccdA
CmR
attP2
ori
KmR
attP1
ccdB

1 GCGTTTCGGCA CGCAGACGAC GGGCTTCATT CTGCATGGTT GTGCTTACCA GACCGGAGAT
61 ATTGACATCA TATATGCCTT GAGCAACTGA TAGCTGTGCG TGTCAACTGT CACTGTAATA
121 CGCTGCTTCA TAGCACACCT CTTTTTGACA TACTTCGGGT ATACATATCA GTATATATTC
181 TTATACCGCA AAAATCAGCG CGCAAATACG CATACTGTTA TCTGGCTTTT AGTAAGCCGG
241 ATCCACGCGT TTACGCCCCG CCCTGCCACT CATCGCAGTA CTGTTGTAAT TCATTAAGCA
301 TTCTGCCGAC ATGGAAGCCA TCACAGACGG CATGATGAAC CTGAATCGCC AGCGGCATCA
361 GCACCTTGTC GCCTTGCGTA TAATATTTGC CCATGGTGAA AACGGGGGCG AAGAAGTTGT
421 CCATATTGGC CACGTTTTAA TCAAACTGG TGAAACTCAC CCAGGGATTG GCTGAGACGA
481 AAAACATATT CTCAATAAAC CCTTTAGGGA AATAGGCCAG GTTTTCACCG TAACACGCCA
541 CATCTTGCGA ATATATGTGT AGAACTGCC GGAAATCGTC GTGGTATTC CTCCAGAGCG
601 ATGAAAACGT TTCAGTTTGC TCATGGAAA CCGTGTAACA AGGGTGAACA CTATCCATA
661 TCACCAGCTC ACCGTCTTTC ATTGCCATAC GGAATTCGG ATGAGCATT ATCAGGCGGG
721 CAAGAATGTG AATAAAGGCC GGATAAACT TGTGCTTATT TTTCTTTACG GTCTTTAAAA
781 AGGCCGTAAT ATCCAGCTGA ACGGTCTGGT TATAGGTACA TTGAGCAACT GACTGAAATG
841 CCTCAAAATG TTCTTTACGA TGCCATTGGG ATATATCAAC GGTGGTATAT CCAGTGATTT
901 TTTTCTCCAT TTAGCTTCC TTAGCTCCTG AAAATCTCGA TAACTCAAAA AATACGCCCG
961 GTAGTGATCT TATTTCAAT TGGTGAAAGT TGGAACCTCT TACGTGCCGA TCAACGTCTC
1021 ATTTTCGCCA AAAGTTGGCC CAGGGCTTCC CGGTATCAAC AGGGACACCA GGATTTATTT
1081 ATTTTCGCCA GTGATCTTCC GTCACAGTA TTTATTCGGC GCAAAGTGCG TCGGGTGATG
1141 CTGCCAACTT AGTCGACTAC AGGTCACTAA TACCATCTAA GTAGTTGATT CATAGTGACT
1201 GGATATGTTG TGTTTTACAG TATTATGTAG TCTGTTTTTT ATGCAAAATC TAATTTAATA
1261 TATTGATATT TATATCATTT TACGTTTCTC GTTCAGCTTT CTGTACAAA GTTGGCATT
1321 TAAGAAAGCA TTGCTTATCA ATTTGTTGCA ACGAACAGGT CACTATCAGT CAAAAATAAA
1381 TCATTATTTG CCATCCAGCT AGCGGTAATA CGGTTATCCA CAGAATCAGG GGATAACGCA
1441 GGAAAGAACA TGTGAGCAAA AGGCCAGCA AAGGCCAGGA ACCGTAAAAA GGCCGCGTTG
1501 CTGGCGTTTT TCCATAGGCT CCGCCCCCT GACGAGCATC AAAAAATCG ACGCTCAAGT
1561 CAGAGGTGGC GAAACCCGAC AGGACTATAA AGATAACAGG CGTTTCCCCC TGGAAGCTCC
1621 CTCGTGCGCT CTCCTGTTCC GACCCTGCCG CTTACCGGAT ACCTGTCCGC CTTTCTCCCT
1681 TCGGGAAGCG TGGCGCTTTC TCATAGCTCA CGCTGTAGGT ATCTCAGTTC GGTGTAGGTC
1741 GTTCGCTCCA AGCTGGGCTG TGTGCACGAA CCCCCGTT AGCCCGACCG CTGCGCCTTA
1801 TCCGGTAACT ATCGTCTTGA GTCCAACCCG GTAAGACACG ACTTATCGCC ACTGGCAGCA
1861 GCCACTGGTA ACAGGATTAG CAGAGCGAGG TATGTAGGCG GTGCTACAGA GTTCTTGAAG
1921 TGGTGGCCTA ACTACGGCTA CACTAGAAGA ACAGTATTTG GTATCTGCGC TCTGCTGAAG
1981 CCAGTTACCT TCGGAAAAAG AGTTGGTAGC TCTTGATCCG GCAAACAAAC CACCGCTGGT
2041 AGCGGTGGTT TTTTGTGTTG CAAGCAGCAG ATTACGCGCA GAAAAAAGG ATCTCAAGAA
2101 GATCCTTTGA TCTTTTCTAC GGGGTCTGAC GCTCAGTGGA ACGAAAACTC ACGTTAAGGG
2161 ATTTTGGTCA TGAGCTTGCG CCGTCCCGTC AAGTCAGCGT AATGCTCTGC CAGTGTTACA
2221 ACCAATTAAC CAATTCTGAT TAGAAAACT CATCGAGCAT CAAATGAAAC TGCAATTTAT
2281 TCATATCAGG ATTATCAATA CCATATTTT GAAAAAGCCG TTTCTGTAAT GAAGGAGAAA
2341 ACTCACCAGG GCAGTTCCAT AGGATGGCAA GATCCTGGTA TCGGTCTGCG ATTCGGACTC
2401 GTCCAACATC AATACAACCT ATTAATTTCC CCTCGTCAAA AATAAGGTTA TCAAGTGAGA
2461 AATCACCATG AGTGACGACT GAATCCGGTG AGAATGGCAA AAGTTTATGC ATTTCTTTCC
2521 AGACTTGTT AACAGGCCAG CCATTACGCT CGTCATCAAA ATCACTCGCA TCAACCAAAC
2581 CGTTATTCAT TCGTGATTGC GCCTGAGCGA GACGAAATAC GCGATCGCTG TTAAGAGGAC
2641 AATTACAAAC AGGAATCGAA TGCAACCGGC GCAGGAACAC TGCCAGCGCA TCAACAATAT
2701 TTTACCTGA ATCAGGATAT TCTTCTAATA CCTGGAATGC TGTTTTTCCG GGGATCGCAG-

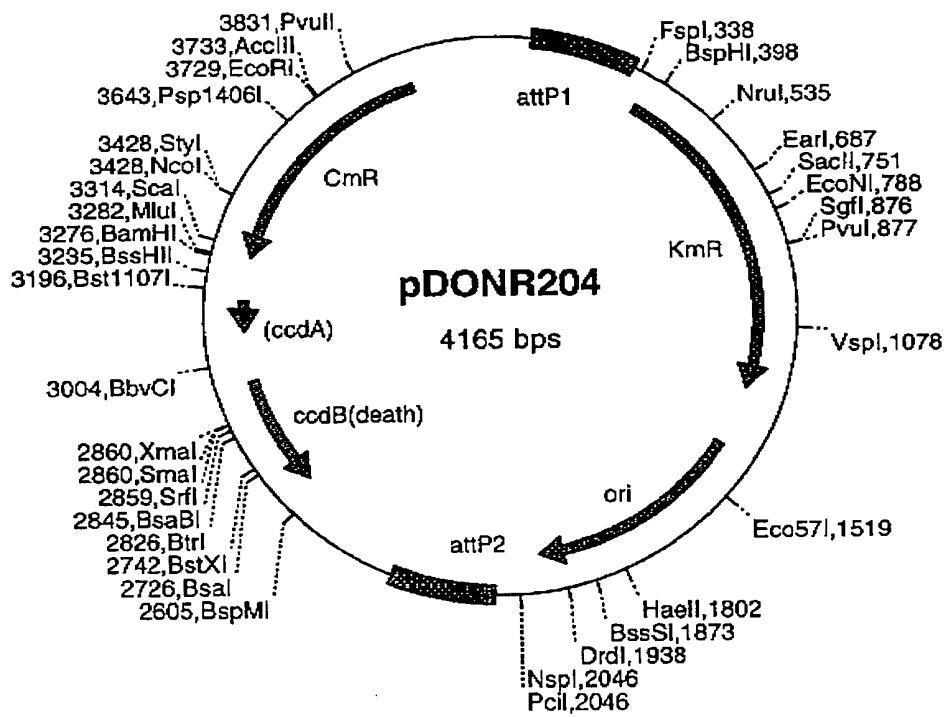
FIGURE 51B

05317466-030000

2761 TGGTGAGTAA CCATGCATCA TCAGGAGTAC GGATAAAATG CTTGATGGTC GGAAGAGGCA
 2821 TAAATTCCGT CAGCCAGTTT AGTCTGACCA TCTCATCTGT AACATCATTG GCAACGCTAC
 2881 CTTTGCCATG TTTCAGAAAC AACTCTGGCG CATCGGGCTT CCCATACAAG CGATAGATTG
 2941 TCGCACCTGA TTGCCCCACA TTATCGCGAG CCCATTTATA CCCATATAAA TCAGCATCCA
 3001 TGTTGGAATT TAATCGCGGC CTCGACGTTT CCCGTTGAAT ATGGCTCATA ACACCCCTTG
 3061 TATTACTGTT TATGTAAGCA GACAGTTTTA TTGTTTCATGA TGATATATTT TTATCTTG TG
 3121 CAATGTAACA TCAGAGATTT TGAGACACGG GCCAGAGCTG CAGCTAGCAT GGATCTCGGG
 3181 CCCCATAATA TGATTTTATT TTGACTGATA GTGACCTGTT CGTTGCAACA AATTGATGAG
 3241 CAATGCTTTT TTATAATGCC AACTTTGTAC AAAAAAGCTG AACGAGAAAC GTAAATGAT
 3301 ATAAATATCA ATATATTTAA TTAGATTTTG CATAAAAAAC AGACTACATA ATACTGTAAA
 3361 ACACAACATA TCCAGTCACT ATGAATCAAC TACTTAGATG GTATTAGTGA CCTGTAGTCG
 3421 ACCGACAGCC TTCCAAATGT TCTTCGGGTG ATGCTGCCAA CTTAGTCGAC CGACAGCCTT
 3481 CCAAATGTTT TTCTCAAACG GAATCGTCGT ATCCAGCCTA CTCGCTATTG TCCTCAATGC
 3541 CGTATTAAAT CATAAAAAGA AATAAGAAAA AGAGGTGCGA GCCTCTTTTT TGTGTGACAA
 3601 AATAAAAACA TCTACCTATT CATATACGCT AGTGTCATAG TCCTGAAAAAT CATCTGCATC
 3661 AAGAACAATT TCACAACCTT TATACTTTTC TCTTACAAGT CGTTCGGCTT CATCTGGATT
 3721 TTCAGCCTCT ATACTTACTA AACGTGATAA AGTTTCTGTA ATTTCTACTG TATCGACCTG
 3781 CAGACTGGCT GTGTATAAGG GAGCCTGACA TTTATATTCC CCAGAACATC AGGTAAATGG
 3841 CGTTTTTGAT GTCATTTTCG CGGTGGCTGA GATCAGCCAC TTCTTCCCCG ATAACGGAGA
 3901 CCGGCACACT GGCCATATCG GTGGTCATCA TGCGCCAGCT TTCATCCCCG ATATGCACCA
 3961 CCGGGTAAAG TTCACGGGAG ACTTTATCTG ACAGCAGACG TGCCTGGCC AGGGGGATCA
 4021 CCATCCGTCG CCCGGGCGTG TCAATAATAT CACTCTGTAC ATCCACAAAC AGACGATAAC
 4081 GGCTCTCTCT TTTATAGGTG TAAACCTTAA ACTGCATTTT ACCAGTCCCT GTTCTCGTCA
 4141 GCAAAAGAGC CGTTCATTTT AATAAACCGG GCGACCTCAG CCATCCCTTC CTGATTTTCC
 4201 GCTTTCCA

FIGURE 51C

1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050 2051 2052 2053 2054 2055 2056 2057 2058 2059 2060 2061 2062 2063 2064 2065 2066 2067 2068 2069 2070 2071 2072 2073 2074 2075 2076 2077 2078 2079 2080 2081 2082 2083 2084 2085 2086 2087 2088 2089 2090 2091 2092 2093 2094 2095 2096 2097 2098 2099 2100 2101 2102 2103 2104 2105 2106 2107 2108 2109 2110 2111 2112 2113 2114 2115 2116 2117 2118 2119 2120 2121 2122 2123 2124 2125 2126 2127 2128 2129 2130 2131 2132 2133 2134 2135 2136 2137 2138 2139 2140 2141 2142 2143 2144 2145 2146 2147 2148 2149 2150 2151 2152 2153 2154 2155 2156 2157 2158 2159 2160 2161 2162 2163 2164 2165 2166 2167 2168 2169 2170 2171 2172 2173 2174 2175 2176 2177 2178 2179 2180 2181 2182 2183 2184 2185 2186 2187 2188 2189 2190 2191 2192 2193 2194 2195 2196 2197 2198 2199 2200 2201 2202 2203 2204 2205 2206 2207 2208 2209 2210 2211 2212 2213 2214 2215 2216 2217 2218 2219 2220 2221 2222 2223 2224 2225 2226 2227 2228 2229 2230 2231 2232 2233 2234 2235 2236 2237 2238 2239 2240 2241 2242 2243 2244 2245 2246 2247 2248 2249 2250 2251 2252 2253 2254 2255 2256 2257 2258 2259 2260 2261 2262 2263 2264 2265 2266 2267 2268 2269 2270 2271 2272 2273 2274 2275 2276 2277 2278 2279 2280 2281 2282 2283 2284 2285 2286 2287 2288 2289 2290 2291 2292 2293 2294 2295 2296 2297 2298 2299 2300 2301 2302 2303 2304 2305 2306 2307 2308 2309 2310 2311 2312 2313 2314 2315 2316 2317 2318 2319 2320 2321 2322 2323 2324 2325 2326 2327 2328 2329 2330 2331 2332 2333 2334 2335 2336 2337 2338 2339 2340 2341 2342 2343 2344 2345 2346 2347 2348 2349 2350 2351 2352 2353 2354 2355 2356 2357 2358 2359 2360 2361 2362 2363 2364 2365 2366 2367 2368 2369 2370 2371 2372 2373 2374 2375 2376 2377 2378 2379 2380 2381 2382 2383 2384 2385 2386 2387 2388 2389 2390 2391 2392 2393 2394 2395 2396 2397 2398 2399 2400 2401 2402 2403 2404 2405 2406 2407 2408 2409 2410 2411 2412 2413 2414 2415 2416 2417 2418 2419 2420 2421 2422 2423 2424 2425 2426 2427 2428 2429 2430 2431 2432 2433 2434 2435 2436 2437 2438 2439 2440 2441 2442 2443 2444 2445 2446 2447 2448 2449 2450 2451 2452 2453 2454 2455 2456 2457 2458 2459 2460 2461 2462 2463 2464 2465 2466 2467 2468 2469 2470 2471 2472 2473 2474 2475 2476 2477 2478 2479 2480 2481 2482 2483 2484 2485 2486 2487 2488 2489 2490 2491 2492 2493 2494 2495 2496 2497 2498 2499 2500 2501 2502 2503 2504 2505 2506 2507 2508 2509 2510 2511 2512 2513 2514 2515 2516 2517 2518 2519 2520 2521 2522 2523 2524 2525 2526 2527 2528 2529 2530 2531 2532 2533 2534 2535 2536 2537 2538 2539 2540 2541 2542 2543 2544 2545 2546 2547 2548 2549 2550 2551 2552 2553 2554 2555 2556 2557 2558 2559 2560 2561 2562 2563 2564 2565 2566 2567 2568 2569 2570 2571 2572 2573 2574 2575 2576 2577 2578 2579 2580 2581 2582 2583 2584 2585 2586 2587 2588 2589 2590 2591 2592 2593 2594 2595 2596 2597 2598 2599 2600 2601 2602 2603 2604 2605 2606 2607 2608 2609 2610 2611 2612 2613 2614 2615 2616 2617 2618 2619 2620 2621 2622 2623 2624 2625 2626 2627 2628 2629 2630 2631 2632 2633 2634 2635 2636 2637 2638 2639 2640 2641 2642 2643 2644 2645 2646 2647 2648 2649 2650 2651 2652 2653 2654 2655 2656 2657 2658 2659 2660 2661 2662 2663 2664 2665 2666 2667 2668 2669 2670 2671 2672 2673 2674 2675 2676 2677 2678 2679 2680 2681 2682 2683 2684 2685 2686 2687 2688 2689 2690 2691 2692 2693 2694 2695 2696 2697 2698 2699 2700 2701 2702 2703 2704 2705 2706 2707 2708 2709 2710 2711 2712 2713 2714 2715 2716 2717 2718 2719 2720 2721 2722 2723 2724 2725 2726 2727 2728 2729 2730 2731 2732 2733 2734 2735 2736 2737 2738 2739 2740 2741 2742 2743 2744 2745 2746 2747 2748 2749 2750 2751 2752 2753 2754 2755 2756 2757 2758 2759 2760 2761 2762 2763 2764 2765 2766 2767 2768 2769 2770 2771 2772 2773 2774 2775 2776 2777 2778 2779 2780 2781 2782 2783 2784 2785 2786 2787 2788 2789 2790 2791 2792 2793 2794 2795 2796 2797 2798 2799 2800 2801 2802 2803 2804 2805 2806 2807 2808 2809 2810 2811 2812 2813 2814 2



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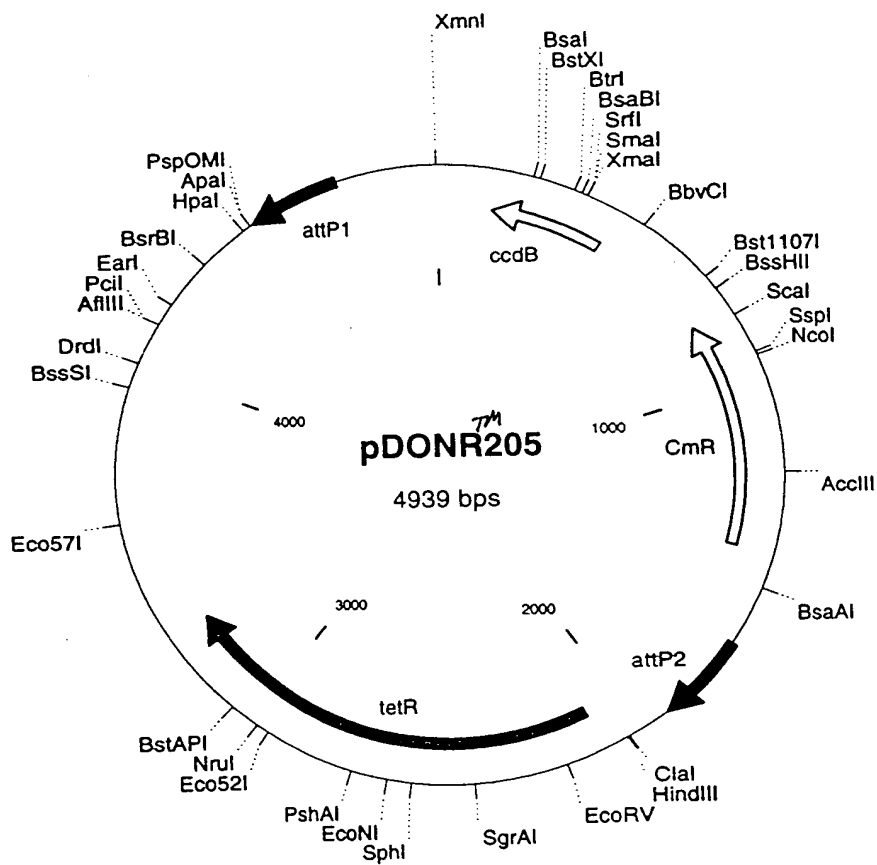
1 CGGCATTGAG GACAATAGCG AGTAGGCTGG ATACGACGAT TCCGTTTGAG AAGAACATTT
61 GGAAGGCTGT CCGTCGACTA CAGGTCACCTA ATACCATCTA AGTAGTTGAA TCATAGTGAC
121 TGGATATGTT GTGTTTTACA GTATTATGTA GTCTGTTTTT TATGCAAAAT CTAATTTAAT
181 ATATTGATAT TTATATCAAT TTACGTTTCT CGTTCAGCTT TTTTGTACAA AGTTGGCATT
241 ATAAAAAAGC ATTGCTTATC AATTTGTTGC AACGAACAGG TCACTATCAG TCAAAAATAAA
301 ATCATTATTT GGGGCCCGAG ATCCATGCTA GCTGCAGTGC GCAGGGCCCCG TGTCTCAAAA
361 TCTCTGATGT TACATTGCAC AAGATAAAAA TATATCATCA TGAACAATAA AACTGTCTGC
421 TTACATAAAC AGTAATACAA GGGGTGTTAT GAGCCATATT CAACGGGAAA CGTCTTGCTG
481 GAGGCCGCGA TTAAATTCCA ACATGGATGC TGATTTTATAT GGGTATAAAT GGGCTCGCGA
541 TAATGTCGGG CAATCAGGTG CGACAATCTT TCGATTGTAT GGGGAAGCCCG ATGCGCCAGA
601 GTTGTCTCTG AAACATGGCA AAGGTAGCGT TGCCAATGAT GTTACAGATG AGATGGTCAG
661 ACTAAACTGG CTGACGGAAT TTATGCCTCT TCCGACCATC AAGCATTTTA TCCGTACTCC
721 TGATGATGCA TGGTTACTCA CCACTGCGAT CCGCGGGAAC ACAGCATTCC AGGTATTAGA
781 AGAATATCCT GATTTCAGGTG AAAATATTGT TGATGCGCTG GCAGTGTTCC TGCGCCGGTT
841 GCATTTCGATT CCTGTTTGTA ATTGTCCTTT TAACAGCGAT CGCGTATTTT GTCTCGCTCA
901 GCGCAATCA CGAATGAATA ACGGTTTGGT TGATGCGAGT GATTTTGATG ACGAGCGTAA
961 TGGCTGGCCT GTTGAACAAG TCTGGAAAGA AATGCATACG CTTTTGCCAT TCTCACCCGA
1021 TTCAGTCGTC ACTCATGGTG ATTTCTCACT TGATAACCTT ATTTTTCACG AGGGGAAATT
1081 AATAGGTTGT ATTGATGTTG GACGAGTCGG AATCGCAGAC CGATACCAGG ATCTTGCCAT
1141 CCTATGGAAC TGCCTCGGTG AGTTTCTCC TTCATTACAG AAACGGCTTT TCAAAAATA
1201 TGGTATTGAT AATCCTGATA TGAATAAAT CTGGCAGAGC ATTACGCTGA CTGACGGGA
1261 CTAATCAGAA TTGGTTAATT GGTGTAAACA CTGGCAGAGC ATTACGCTGA CTGACGGGA
1321 CGGCGNCATG ACCAAAATCC CTTAACGTGA GTTTTTCGTT CACTGAGCGT CAGACCCCGT
1381 AGAAAAGATC AAAGGATCTT CTTGAGATCC TTTTTTCTG CGCGTAATCT GCTGCTTGCA
1441 AACAAAAAAA CCACCGCTAC CAGCGGTGGT TTGTTTGCCG GATCAAGAGC TACCAACTCT
1501 TTTTCCGAAG GTAACCTGGT TCAGCAGAGC GCAGATACCA AATACTGTCC TTCTAGTGTA
1561 GCCGTAGTTA GGCCACCACT TCAAGAACTC TGTAGCACC GCTACATACC TCGCTCTGCT
1621 AATCCTGTTA CCAGTGGCTG CTGCCAGTGG CGATAAGTCG TGTCTTACCG GGTGGACTC
1681 AAGACGATAG TTACCGGATA AGGCGCAGCG GTCGGGCTGA ACGGGGGGTT CGTGCACACA
1741 GCCCAGCTTG GAGCGAACGA CCTACACCGA ACTGAGATAC CTACAGCGTG AGCTATGAGA
1801 AAGCGCCACG CTTCCCGAAG GGAGAAAGGC GGACAGGTAT CCGGTAAGCG GCAGGGTCGG
1861 AACAGGAGAG CGCACGAGGG AGCTTCCAGG GGGAAACGCC TGGTATCTTT ATAGTCCTGT
1921 CGGGTTTCGC CACCTCTGAC TTGAGCGTCG ATTTTGTGA TGCTCGTCAG GGGGGCGGAG
1981 CCTATGGAAA AACGCCAGCA ACGCGGCCTT TTTACGGTTC CTGGCCTTTT GCTGGCCTTT
2041 TGCTCACATG TTCTTTCTCTG CGTTATCCCC TGATTCTGTG GATAACCGTA TTACCGCTAG
2101 CTGGATCGGC AAATAATGAT TTTATTTTGA CTGATAGTGA CCTGTTCTGT GCAACAAATT
2161 GATAAGCAAT GCTTTTTTAT AATGCCAACT TTGTACAAGA AAGCTGAACG AGAAACGTAA
2221 AATGATATAA ATATCAATAT ATTAAATTAG ATTTTGCATA AAAACAGAC TACATAATAC
2281 TGTAAAACAC AACATATCCA GTCACATGTA TTCAACTACT TAGATGGTAT TAGTGACCTG
2341 TAGTCGACTA AGTTGGCAGC ATCACCCGAC GCACCTTGCG CCGAATAAAT ACCTGTGACG
2401 GAAGATCACT TCGCAGAATA AATAAATCCT GGTGTCCCTG TTGATACCGG GAAGCCCTGG
2461 GCCAACTTTT GGCGAAAATG AGACGTTGAT CGGCACATTT CACAACCTTT ATACTTTCT
2521 CTTACAAGTC GTTCGGCTTC ATCTGGATTT TCAGCCTCTA TACTTACTAA ACGTGATAAA
2581 GTTTCTGTAA TTTCTACTGT ATCGACCTGC AGACTGGCTG TGTATAACGG AGCCTGACAT
2641 TTATATTCCC CAGAACATCA GGTAAATGGC GTTTTGTATG TCATTTTTCG GGTGGCTGAG
2701 ATCAGCCACT TCTTCCCCGA TAACGGAGAC CGGCACACTG GCCATATCGG TGGTCATCAT
2761 GCGCCAGCTT TCATCCCCGA TATGCACCAC CGGGTAAAGT TCACGGGAGA CTTTATCTGA
2821 CAGCAGACGT GCACTGGCCA GGGGGATCAC CATCCGTCGC CCGGGCGTGT CAATAATATC
2881 ACTCTGTACA TCCACAAACA GACGATAACG GCTCTCTCTT TTATAGGTGT AAACCTTAAA
2941 CTGCATTTC AAGTCCCTG TTCTCGTCAG CAAAAGAGCC GTTCATTTC AATAACCGGG
3001 CGACCTCAGC CATCCCTTCC TGATTTTCCG CTTTCCAGCG TTCGGCACGC AGACGACGGG
3061 CTTCAATTCTG CATGGTTGTG CTTACCAGAC CGGAGATATT GACATCATAT ATGCCCTGAG
3121 CAACTGATAG CTGTCGCTGT CAACTGTCAC TGTAATACGC TGCTTCATAG CACACCTCTT-

FIGURE 52B

3181 TTTGACATAC TTCGGGTATA CATATCAGTA TATATTCTTA TACCGCAAAA ATCAGCGCGC
 3241 AAATACGCAT ACTGTTATCT GGCTTTTAGT AAGCCGATC CACGCGTTTA CGCCCCGCCC
 3301 TGCCACTCAT CGCAGTACTG TTGTAATTCA TTAAGCATTC TGCCGACATG GAAGCCATCA
 3361 CAGACGGCAT GATGAACCTG AATCGCCAGC GGCATCAGCA CCTTGTCGCC TTGCGTATAA
 3421 TATTTGCCCC TGGTGAAAAC GGGGGCGAAG AAGTTGTCCA TATTGGCCAC GTTTAAATCA
 3481 AAAGTGGTGA AACTCACCCA GGGATTGGCT GAGACGAAAA ACATATTCTC AATAAACCTT
 3541 TTAGGGAAAT AGGCCAGGTT TTCACCGTAA CACGCCACAT CTTGCGAATA TATGTGTAGA
 3601 AACTGCCGGA AATCGTCGTG GTATTCACTC CAGAGCGATG AAAACGTTTC AGTTTGCTCA
 3661 TGGAAAACGG TGTAACAAGG GTGAACACTA TCCCATATCA CCAGCTCACC GTCTTTCATT
 3721 GCCATACGGA ATTCCGGATG AGCATTATC AGGCGGGCAA GAATGTGAAT AAAGGCCGGA
 3781 TAAAACTTGT GCTTATTTT CTTTACGGTC TTTAAAAAGG CCGTAATATC CAGCTGAACG
 3841 GTCTGGTTAT AGGTACATTG AGCAACTGAC TGAAATGCCT CAAAATGTTC TTTACGATGC
 3901 CATTGGGATA TATCAACGGT GGTATATCCA GTGATTTTTT TCTCCATTTT AGCTTCCTTA
 3961 GCTCCTGAAA ATCTCGATAA CTCAAAAAAT ACGCCCGGTA GTGATCTTAT TTCATTATGG
 4021 TGAAAGTTGG AACCTCTTAC TGTCTTTGAT GCAGATGATT TTCAGGACTA TGACACTAGC
 4081 ATATATGAAT AGGTAGATGT TTTTATTTTG TCACACAAAA AAGAGGCTCG CACCTCTTTT
 4141 TCTTATTTCT TTTTATGATT TAATA

FIGURE 52C

1. The first group of people who are interested in the results of the study are the researchers themselves. They want to know if the study was successful in achieving its objectives and if the data collected is reliable and valid.



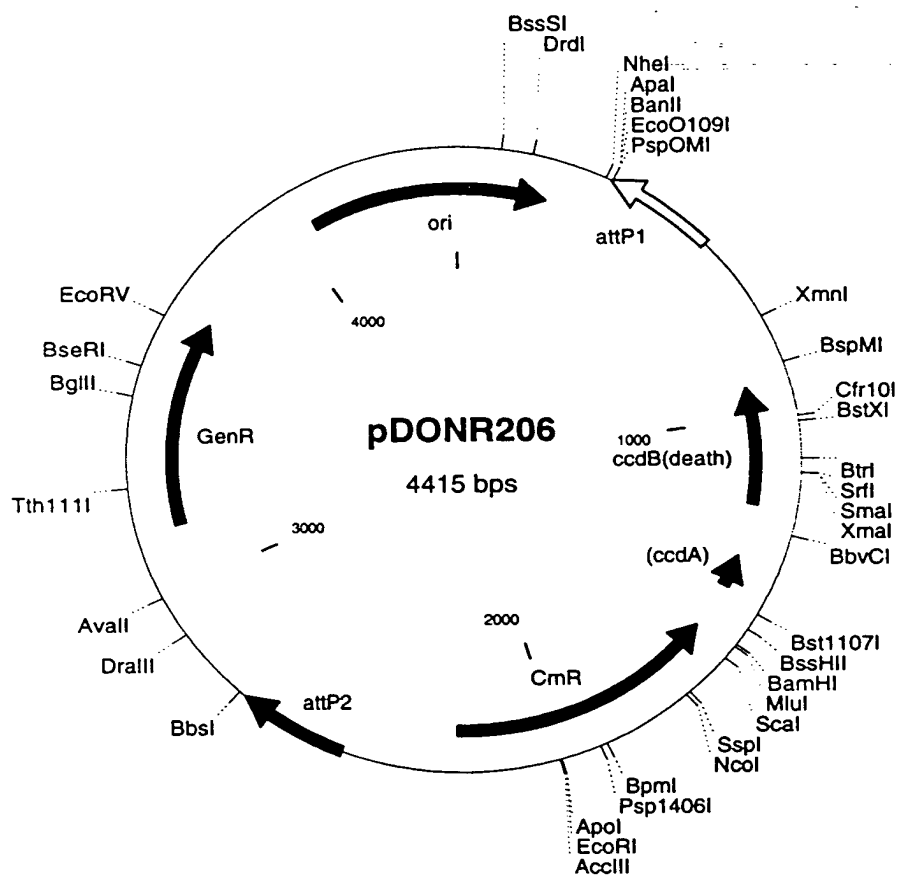
pDONR205 4939 bp

GGCATCAGCACCTTGTGCGCTTGGCGTATAATATTTGCCCATGGTGAAAACGGGGGCGAAG
AAGTTGTCCATATTGGCCACGTTTAAATCAAACCTGGTGAACTCAGCCAGGGATTGGCT
GAGACGAAAAACATATTCTCAATAAACCCCTTTAGGGAAATAGGCCAGGTTTTCCACCGTAA
CACGCCACATCTTGCGAATATATGTGTAGAACTGCCGGAAATCGTCGTGGTATTCACTC
CAGAGCGATGAAAACGTTTCAGTTTGCTCATGGAAAACGGTGTAACAAGGGTGAACACTA
TCCCATATCACCAGCTCAGCGTCTTTTCATTGCCATACGGAATCCGGATGAGCATTTCATC
AGGCGGGCAAGAATGTGAATAAAGGCCGGATAAACTTGTGCTTATTTTTCTTTACGGTC
TTTAAAAAGGCCGTAATATCCAGCTGAACGGTCTGGTTATAGGTACATTGAGCAACTGAC
TGAAATGCCTCAAAATGTTCTTTACGATGCCATTGGGATATATCAACGGTGGTATATCCA
GTGATTTTTTTCTCCATTTTAGCTTCCTTAGCTCCTGAAAATCTCGATAACTCAAAAAAT
ACGCCCCGGTAGTGATCTTATTTTCATTATGGTGAAAGTTGGAACCTCTTACGTGCCGATCA
ACGTCTCATTTTCGCCAAAAGTTGGCCCAGGGCTTCCCGGTATCAACAGGGACACCAGGA
TTTATTTATTTCTGCGAAGTGATCTTCCGTACAGGTATTTATTCGGCGCAAAGTGCGTCG
GGTGATGCTGCCAACTTAGTCGACTACAGGTCACTAATACCATCTAAGTAGTTGATTTCAT
AGTGACTGGATATGTTGTGTTTTACAGTATTATGTAGTCTGTTTTTATGCAAAATCTAA
TTTAATATATTGATATTTATATCATTTTACGTTTCTCGTTCAGCTTTCTTGTACAAAGTT
GGCATTATAAGAAAGCATTGCTTATCAATTTGTTGCAACGAACAGGTCACTATCAGTCAA
AATAAAATCATTATTTGCCATCCAGCTGCAGCTCTGGCCCCGTGTCTCAAAATCTCTGATG
TTACATTGCACAAGATAAAAAATATATCATCATGAATTTCTCATGTTTGACAGCTTATCATC
GATAAGCTTTAATGCGGTAGTTTATCACAGTTAAATTGCTAACGCAGTCAGGCACCGTGT
ATGAAATCTAACAATGCGCTCATCGTCATCCTCGGCACCGTCACCCTGGATGCTGTAGGC
ATAGGCTTGGTTATGCCGGTACTGCCGGGCCCTTTCGGGGATATCGTCCATTCCGACAGC
ATCGCCAGTCACTATGGCGTGCTGCTAGCGCTATATGCGTTGATGCAATTTCTATGCGCA
CCCCGTTCTCGGAGCACTGTCCGACCGCTTTGGCCGCCGCCAGTCTGTCTCGCTTCGCTA
CTTGGAGCCACTATCGACTACGCGATCATGGCGACCACACCCGTCCTGTGGATCCTCTAC
GCCGAGCGCATCGTGGCCGGCATCACCGGCGCCACAGGTGCGGTGCTGGCGCCTATATC
GCCGACATCACCGATGGGGAAGATCGGGCTCGCCACTTCGGGCTCATGAGCGCTTGTTTT
GGCGTGGGTATGGTGGCAGGCCCCGTGGCCGGGGGACTGTTGGGCGCCATCTCCTTGCAT
GCACCATTCCTTGGCGCGGCGGTGCTCAACGGCCTCAACCTACTACTGGGCTGCTTCCTA
ATGCAGGAGTCGCATAAGGGAGAGCGTCGACCGATGCCCTTGAGAGCCTTCAACCCAGTC
AGCTCCTTCCGGTGGGCGCGGGGCATGACTATCGTCGCCGCACTTATGACTGTCTTCTTT
ATCATGCAACTCGTAGGACAGGTGCCGGCAGCGCTCTGGGTCAATTTTCGGCGAGGACCGC
TTTCGCTGGAGCGCGACGATGATCGGCCTGTCTGCTTGGCGTATTTCGGAATCTTGACGCC
CTCGCTCAAGCCTTCGTCACTGGTCCC GCCACCAAACGTTTCGGCGAGAAGCAGGCCATT
ATCGCCGGCATGGCGGCCGACGCGCTGGGCTACGTCTTGCTGGCGTTTCGCGACGCGAGGC
TGGATGGCCTTCCCCATTATGATTCTTCTCGCTTCCGGCGGCATCGGGATGCCCGCGTTG
CAGGCCATGCTGTCCAGGCAGGTAGATGACGACCATCAGGGACAGCTTCAAGGATCGCTC
GCGGCTCTTACCAGCCTAACCTTCGATCATTTGGACCGCTGATCGTCACGGCGATTTATGCC
GCCTCGGCGAGCACATGGAACGGGTTGGCATGGATTGTAGGCGCCGCCCTATACCTTGTC
TGCTTCCCCGCGTTGCGTCGCGGTGCATGGAGCCGGGCCACCTCGACCTGAATGGAAGCC
GGCGGCACCTCGCTAACGGATTCAACACTCCAAGAATTGGAGCCAATCAATTTCTGCGGA
GAACTGTGAATGCGCAAACCAACCCTTGGCAGAACATATCCATCGCATGACCAAAATCCC
TTAACGTGAGTTTTCTGTTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTC
TTGAGATCCTTTTTTTCTGCGCGTAATCTGCTGCTTGCAAACAAAAAACACCGCTACC
AGCGGTGGTTTTGTTTCCGGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAAGTGGCTT
CAGCAGAGCGCAGATACCAAATACTGTCTTCTAGTGTAGCCGTAGTTAGGCCACCACTT
CAAGAACTCTGTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAAGTGGCTGC
TGCCAGTGGCGATAAGTCTGTCTTACCGGGTTGGACTCAAGACGATAGTTACCGGATAA
GGCGCAGCGGTCCGGCTGAACGGGGGGTTCTGTGCACACAGCCAGCTTGGAGCGAACGAC
CTACACCGAACTGAGATACCTACAGCGTGAGCTATGAGAAAGCGCCACGCTTCCCGAAGG
GAGAAAGGCGGACAGGTATCCGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGA
GCTTCCAGGGGGAAACGCCTGGTATCTTTATAGTCCTGTGCGGTTTTCGCCACCTCTGACT
TGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGGCGGAGCCTATGGAAAAACGCCAGCAA-

FIGURE 53B

FIGURE 53C

Figure 54A **pDONR206 (genR)**



pDONR206 4415 bp

CGGCATTGAGGACAATAGCGAGTAGGCTGGATACGACGATTCCGTTTGAGAAGAACATTT
GGAAGGCTGTCGGTCGACTACAGGTCCTAATACCATCTAAGTAGTTGAATCATAGTGAC
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ATATTGATATTTATATCATTTTTACGTTTCTCGTTCAGCTTTTTTGTACAAAGTTGGCATT
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ATCATTATTTGGGGCCCGAGATCCATGCTAGCGGTAATACGGTTATCCACAGAATCAGGG
GATAACGCAGGAAAGAACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAAG
GCCGCGTTGCTGGCGTTTTTCCATAGGCTCCGCCCCCTGACGAGCATCACAAAATCGA
CGCTCAAGTCAGAGGTGGCGAAACCCGACAGGACTATAAAGATACCAGGCGTTTTCCCCCT
GGAAGCTCCCTCGTGCGCTCTCCTGTTCCGACCCTGCCGCTTACCGGATACCTGTCCGCC
TTTCTCCCTTCGGGAAGCGTGGCGTTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCTG
GTGTAGGTCGTTGCTCCAAGCTGGGCTGTGTGCACGAACCCCCGTTTACGCCCCACCGC
TGCGCCTTATCCGGTAACTATCGTCTTGAGTCCAACCCGGTAAGACACGACTTATCGCCA
CTGGCAGCAGCCACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCGGTGCTACAGAG
TTCTTGAAGTGGTGGCCTAACTACGGCTACACTAGAAGGACAGTATTTGGTATCTGCGCT
CTGCTGAAGCCAGTTACCTTCGGAAAAAGAGTTGGTAGCTCTTGATCCGGCAAACAAACC
ACCGCTGGTAGCGGTGGTTTTTTTTGTTTGCAAGCAGCAGATTACGCGCAGAAAAAAGGA
TCTCAAGAAGATCCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGGAACGAAACTCA
CGTTAAGGGATTTTGGTTCATGNCGCCGTCCCGTCAAGTCAGCGTAATGCTCTGCCAGTGT
TACAACCAATTAACCAATTCTGATTAGAAAAACTCATCGAGCATCAAAATGAAACTGCAAT
TTATTATATCAGGATTATCAATACCATATTTTTGAAAAAGCCGTTTCTGTAATGAAGGA
GAAAACTCACCAGGCGAGTTCCATAGGATGGCAAGATCCTGGTATCGGTCTGCGATTCCG
ACTCGTCCAACATCAATACAACCTATTAGCCGAGGTCTTCCGATCTCCTGAAGCCAGGGC
AGATCCGTGCACAGCACCTTGCCGTAGAAGAACAGCAAGGCCGCAATGCCTGACGATGC
GTGGAGACCGAAACCTTGCGCTCGTTGCCAGCCAGGACAGAAATGCCTCGACTTCGCTG
CTGCCCAAGTTGCCGGGTGACGCACACCGTGGAAACGGATGAAGGCACGAACCCAGTTG
ACATAAGCCTGTTCCGTTTCGTAACTGTAATGCAAGTAGCGTATGCGCTCACGCAACTGG
TCCAGAACCTTGACCGAACGCAGCGGTGGTAACGGCGCAGTGGCGGTTTTTCATGGCTTGT
TATGACTGTTTTTTTTGTACAGTCTATGCCTCGGGCATCCAAGCAGCAAGCGCGTTACGCC
GTGGGTGCGATGTTTGATGTTATGGAGCAGCAACGATGTTACGCAGCAGCAACGATGTTAC
GCAGCAGGGCAGTCGCCCTAAACAAAGTTAGGTGGCTCAAGTATGGGCATCATTTCGCAC
ATGTAGGCTCGGCCCTGACCAAGTCAAATCCATGCGGGCTGCTTTGATCTTTTCGGTCTG
TGAGTTCCGAGACGTAGCCACCTACTCCCAACATCAGCCGGACTCCGATTACCTCGGGAA
CTTGCTCCGCTAGTAAGACATTCATCGCGCTTGCTGCCTTCGACCAAGAAGCGGTTGTTGG
CGCTCTCGCGGCTTACGTTTCTGCCCAGGTTTGAGCAGCCGCGTAGTGAGATCTATATCTA
TGATCTCGCAGTCTCCGGCGAGCACCGGAGGCAGGGCATTGCCACCGCGCTCATCAATCT
CCTCAAGCATGAGGCCAACCGCGCTTGGTGCTTATGTGATCTACGTGCAAGCAGATTACGG
TGACGATCCCGCAGTGGCTCTCTATACAAAGTTGGGCATACGGGAAGAAGTGATGCACTT
TGATATCGACCCAAGTACCGCCACCTAACCAATTCGTTCAAGCCGAGATCGGCTTCCCGGC
CTAATTTCCCTCGTCAAAAATAAGGTTATCAAGTGAGAAATCACCATGAGTGACGACTG
AATCCGGTGAGAATGGCAAAAGCGTATGCATTTCTTTCCAGACTTGTTCAACAGGCCAGC
CATTACGCTCGTCATCAAAATCACTCGCATCAACCAACCGTTATTTCATTCGTGATTGCG
CCTGAGCGAGACGAAATACGCGATCGCTGTTAAAAGGACAATTACAAACAGGAATCGAAT
GCAACCGGCGCAGGAACACTGCCAGCGCATCAACAATATTTTACCTGAATCAGGATATT
CTTCTAATACCTGGAATGCTGTTTTCCCGCGGATCGCAGTGGTGAGTAACCATGCATCAT
CAGGAGTACGGATAAAATGCTTGATGGTCGGAAGAGGCATAAATCCGTCAGCCAGTTTA
GTCTGACCATCTCATCTGTAAACATCATTGGCAACGCTACCTTTGCCATGTTTCAGAAACA
ACTCTGGCGCATCGGGCTTCCCATACAATCGAAAGATTGTGCGACCTGATTGCCCCGACAT
TATCGCGAGCCCATTTTATACCATATAAATCAGCATCCATGTTGGAATTTAATCGCGGCC
TCCAGCAAGACGTTTCCCGTTGAATATGGCTCATAACACCCCTTGTATTACTGTTTATGT
AAGCAGACAGTTTTATTGTTTCATGATGATATATTTTTATCTTGTGCAATGTAACATCAGA
GATTTTGTAGACACGGGCCCCNGCGCACTGCAGCTGGATCGGCAAATAATGATTTTATTTTG
ACTGATAGTGACCTGTTGCTTGCAACAAATTGATAAGCAATGCTTTTTTATAATGCCAAC -

FIGURE 54B

THE
JOURNAL
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BRITAIN
AND IRELAND
PUBLISHED
BY THE
INSTITUTE
4, BEDFORD SQUARE, LONDON, W.C.1
1906

1.

Figure 55 An Entry (pENTR7) Clone of CAT Subcloned into pDEST2

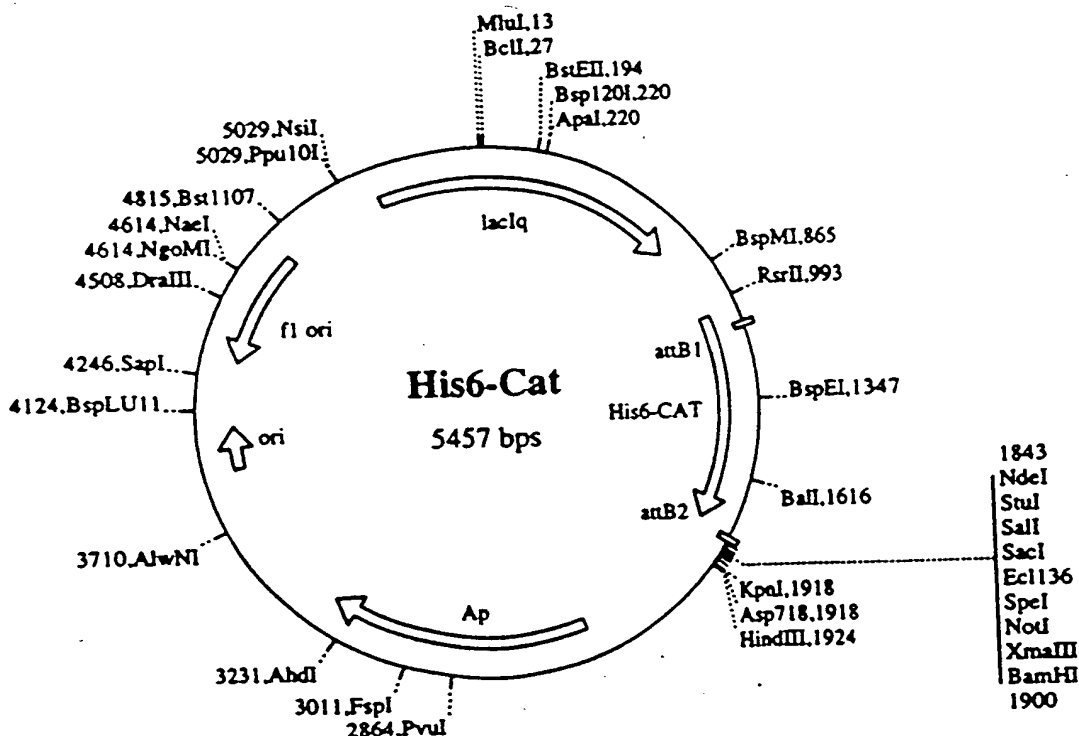
1021 cgg ata aca att tca cac agg aaa cag acc ^{Start translation} Met Ser Tyr Tyr His His His
gcc tat tgt taa agt gtc tcc ttt gtc tgg tac agc atg atg gta gtg gta

1072 His His His Gly Ile Thr Ser Leu Tyr Lys Lys Ala Gly Phe Gly Asn Leu
cac cat cac ggc atc aca agt ttg tac aaa aaa gca ggc ttt gaa aac ctg
gtg gta gtg ccg tag tgt tca aac atg ttt ttt cgt ccg aaa ctt ttg gac

From pDEST2 → ← From pENTR7

TEV protease → Start CAT

1123 Tyr Phe Gln Gly Thr Met Gly Lys Lys Ile Thr Gly Tyr Thr Thr Val Asp
tat ttt caa gga acc atg gag aca aaa atc act gga tat acc acc gtt gat
ata aaa gtt cct tgg tac ctc ttt ttt tag tga cct ata tgg tgg caa cta



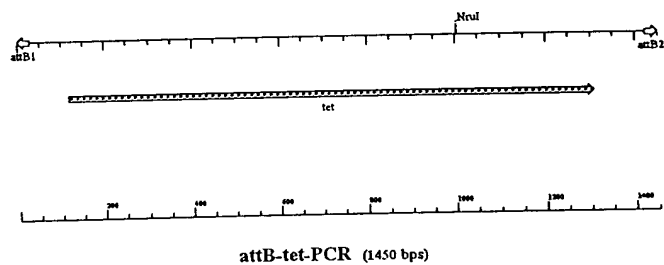
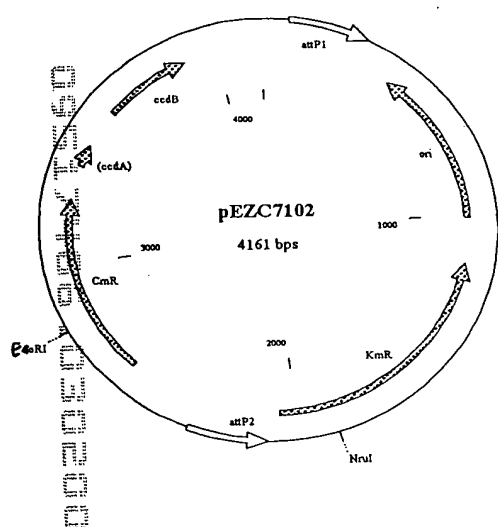


FIGURE 56

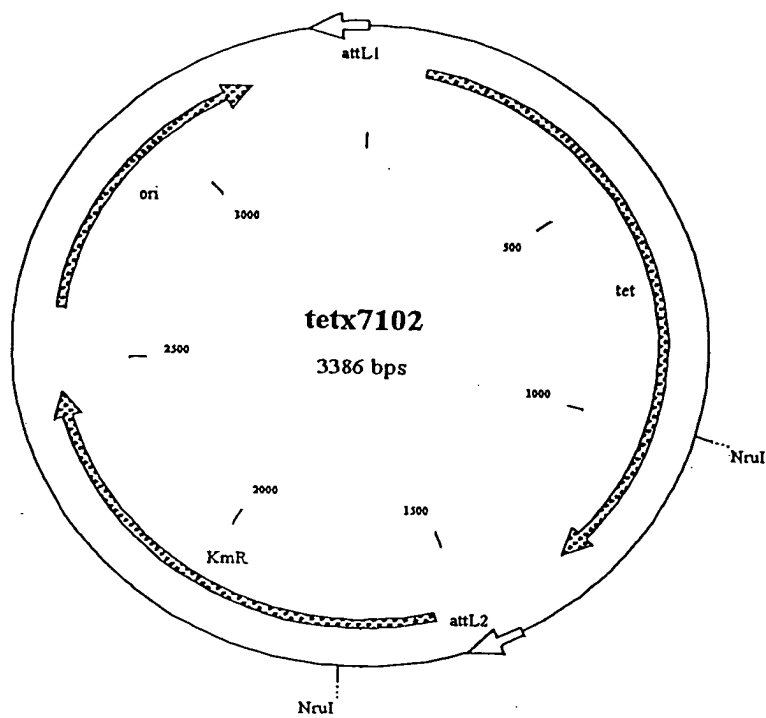


FIGURE 57

FIGURE 58

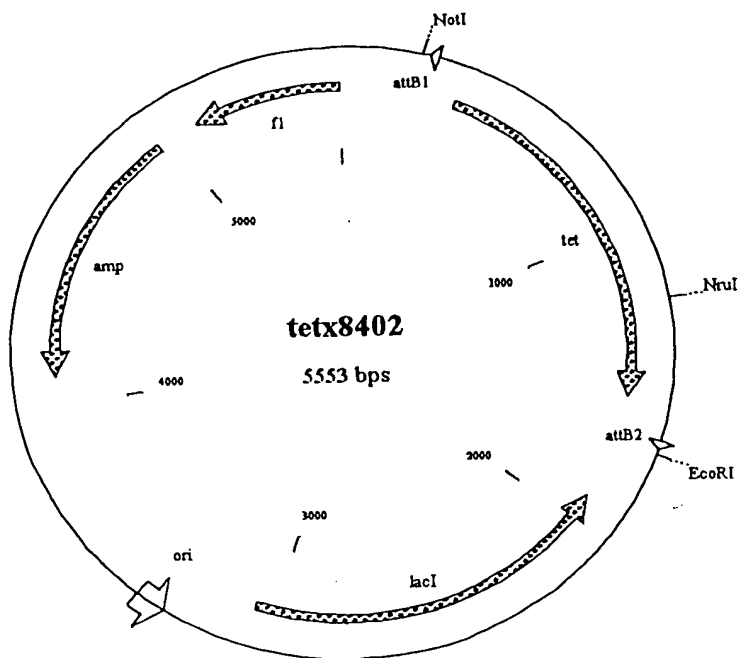


FIGURE 59

003060 0347560

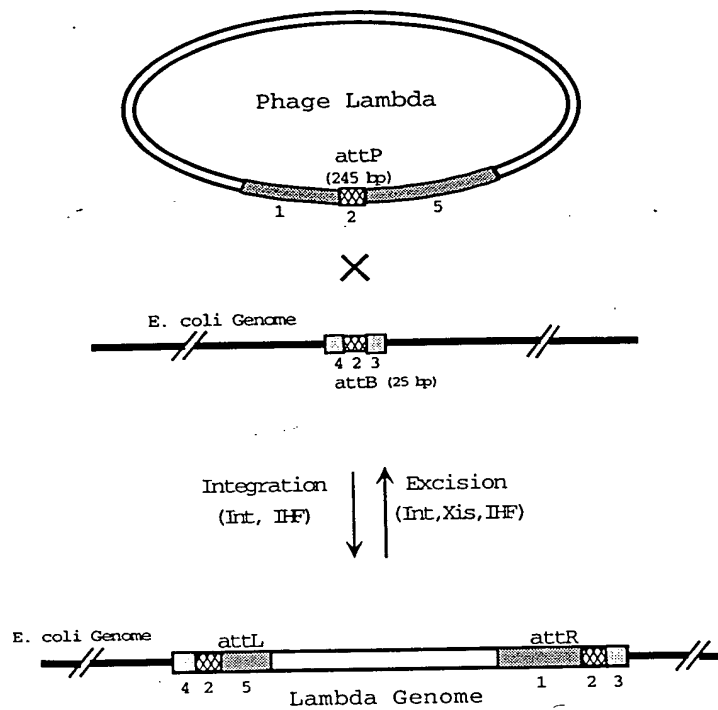


FIGURE 60

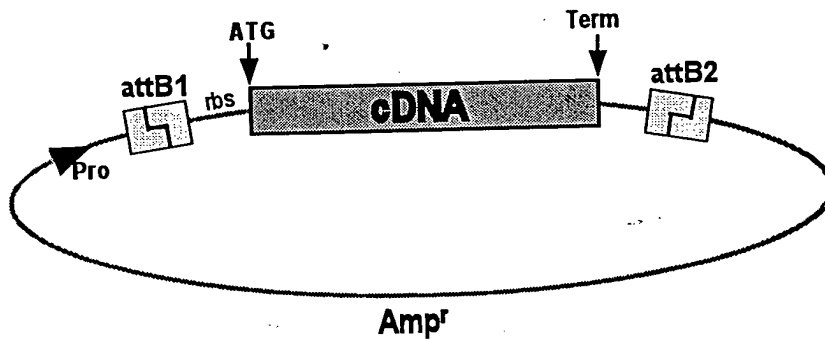
The diagram illustrates the Gateway cloning strategy through three sequential recombination steps:

- Top Step:** An **Entry Clone** (containing a **Gene**, **attL1**, **attL2**, and **Km^r**) and a **Destination Vector** (containing **ccdB**, **attR1**, **attR2**, and **Amp^r**) undergo recombination at the **attL2 X attR2** site. This results in a **Co-integrate** intermediate.
- Middle Step:** The **Co-integrate** intermediate (containing **Gene**, **attL1**, **attB2**, **Amp^r**, **Km^r**, **attP2**, and **ccdB**) undergoes recombination at the **attL1 X attR1** site. This results in a **Functional Subclone** and a **By-product**.
- Bottom Step:** The **Functional Subclone** (containing **Gene**, **attB1**, **attB2**, and **Amp^r**) is the final product of the cloning process.

FIGURE 61

002250 0046T660

Native Protein Expression:



Fusion Protein Expression:

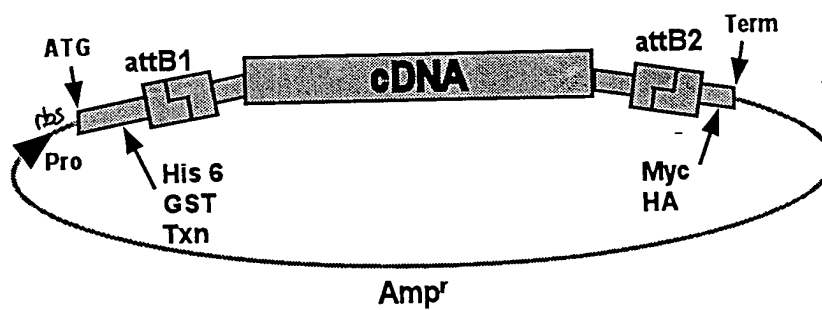


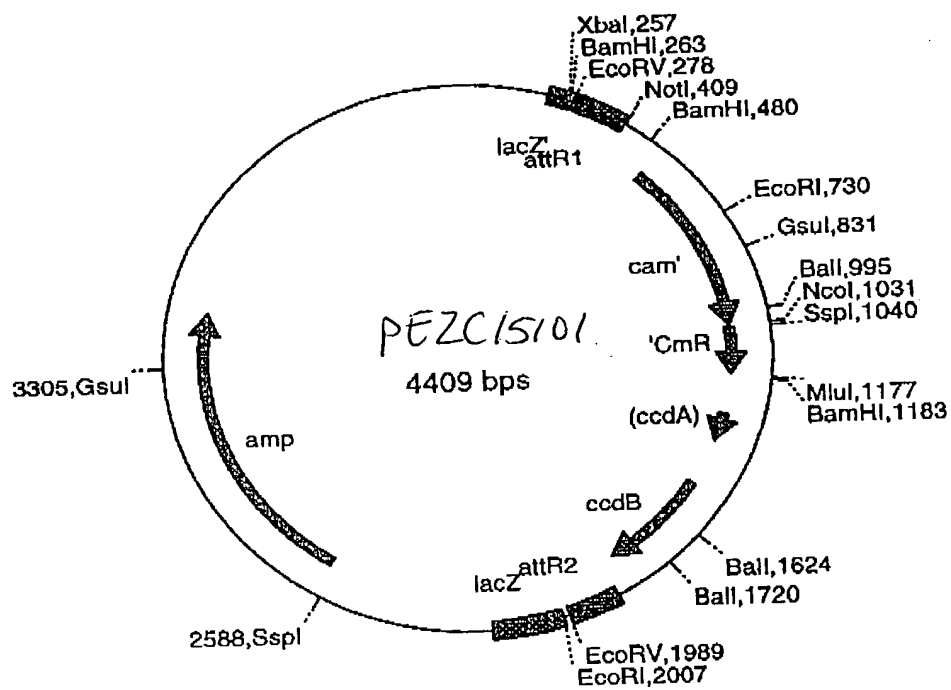
FIGURE 62

THE **NEW** **YORK** **PUBLIC** **LIBRARY**



FIGURE 63

FIGURE 64A



003050-0047650

FIGURE 4B

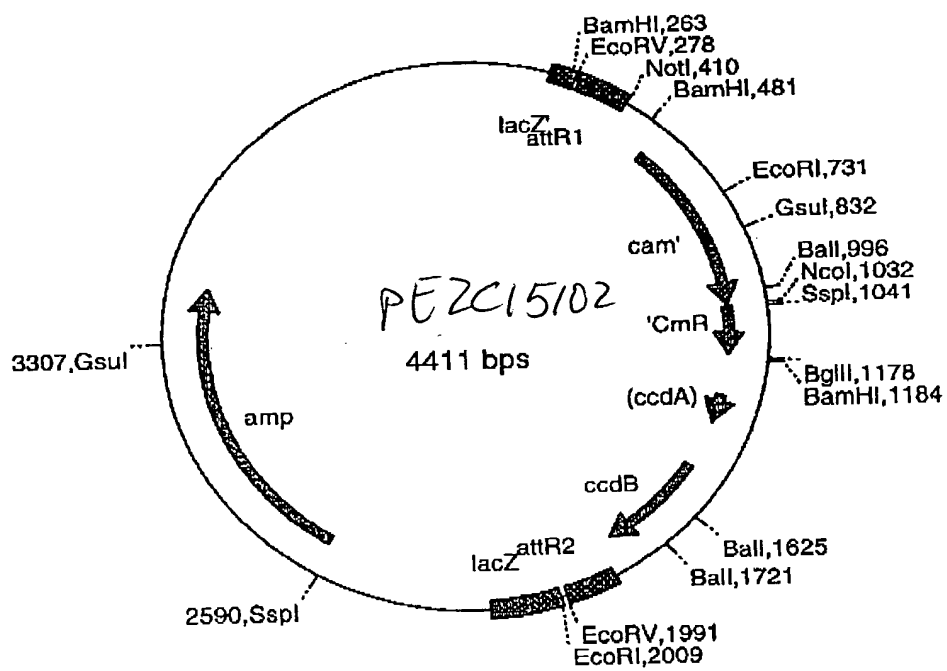
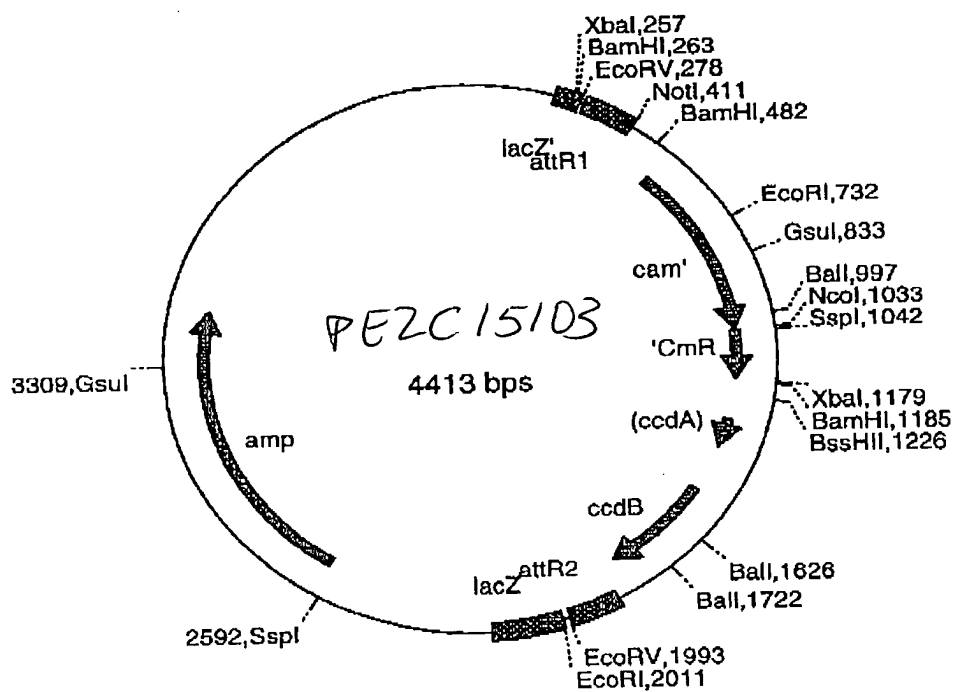


FIGURE 64C



002000 00447650

Primers for Amplifying tetR and ampR for Cloning by Recombination

Primers

Reverse Primers

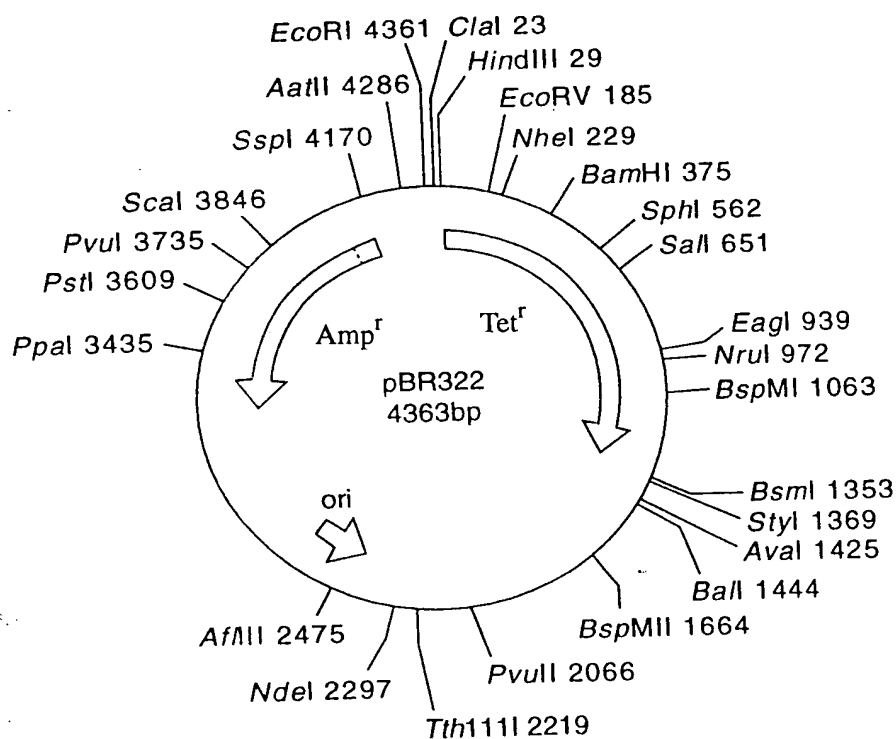
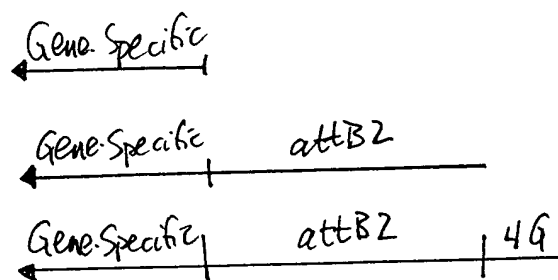
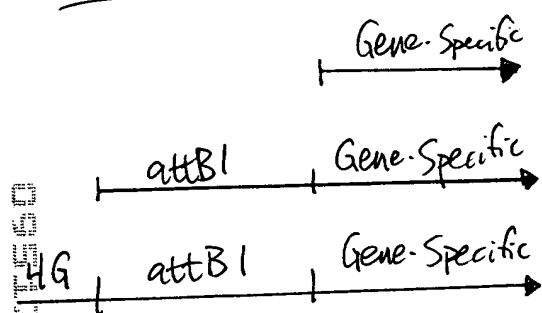


FIGURE 65

Results of Cloning tet and amp PCR Products by Recombination

PCR Product Used in GCS Reactions	No. Colonies Obtained (100 ul plated)	Form of DNA Analyzed	Colonies Obtained of Predicted Size
tet	6, 10	SC	0 of 8
attB-tet	9, 6	SC	1 of 8
attB+4G-tet	824, 1064	SC AvaI+Bam	7 of 7 7 of 7
amp	7, 13	SC	0 of 8
attB-amp	18, 22	SC	3 of 8
attB+4G-amp	3020, 3540	SC PstI	8 of 8 8 of 8
attB Plasmid (Pos. Control)	320, 394		

FIGURE 66

002050" 00447550

002050 00421550

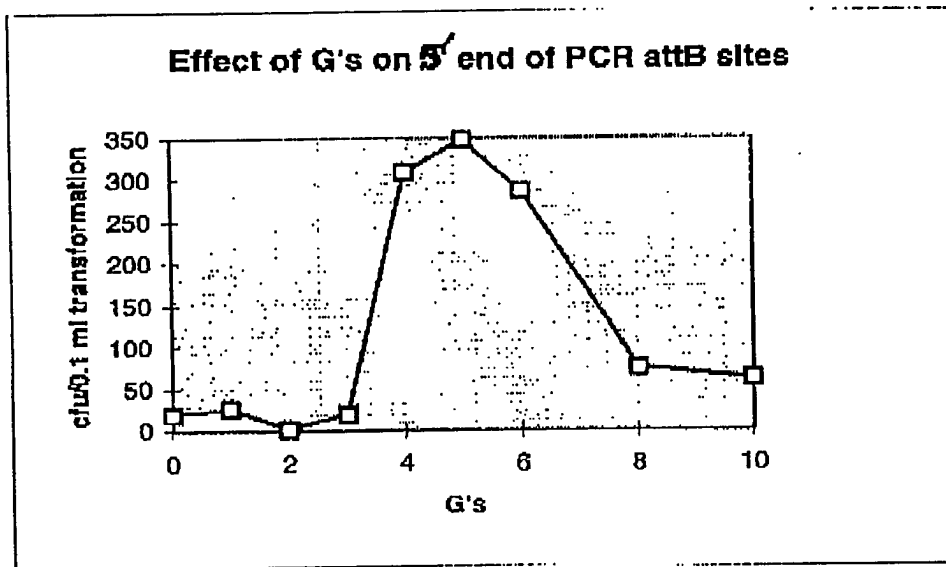


FIGURE 67

002060 99427550

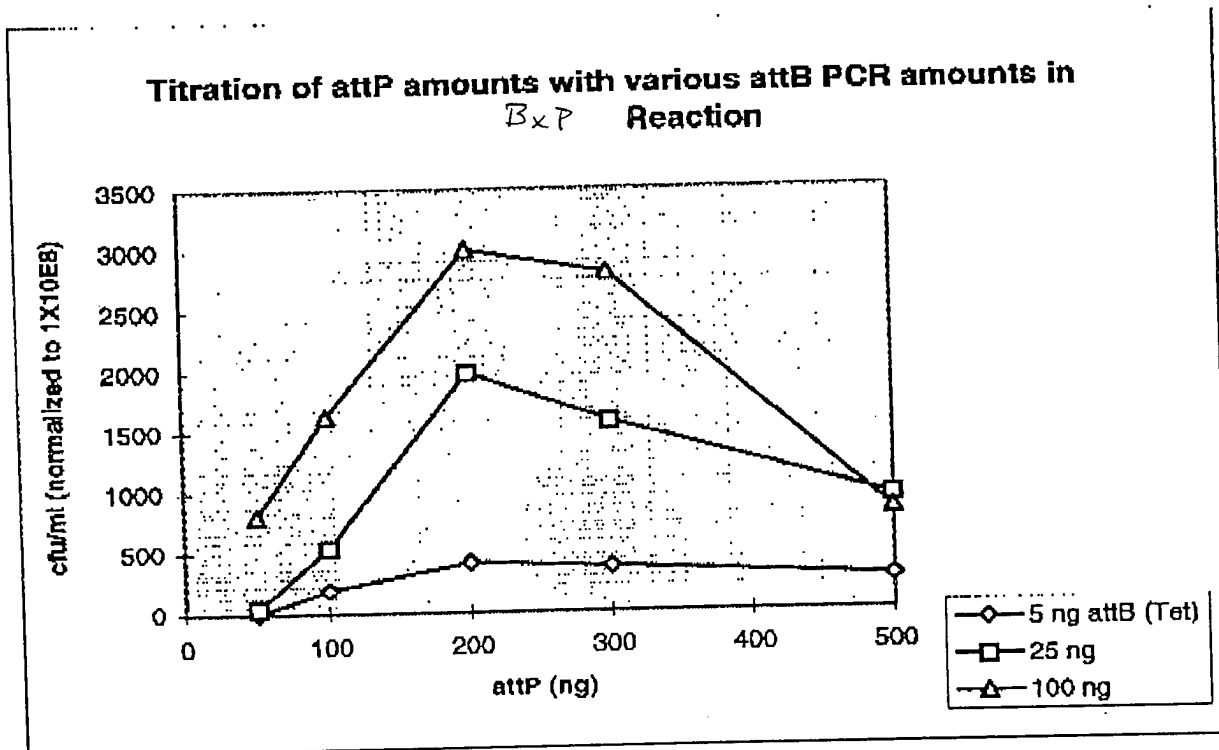
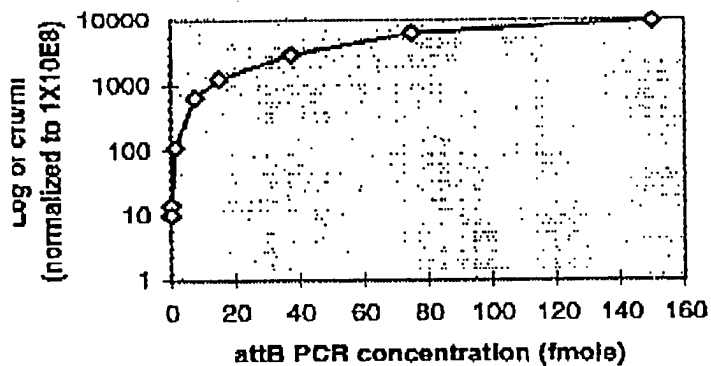


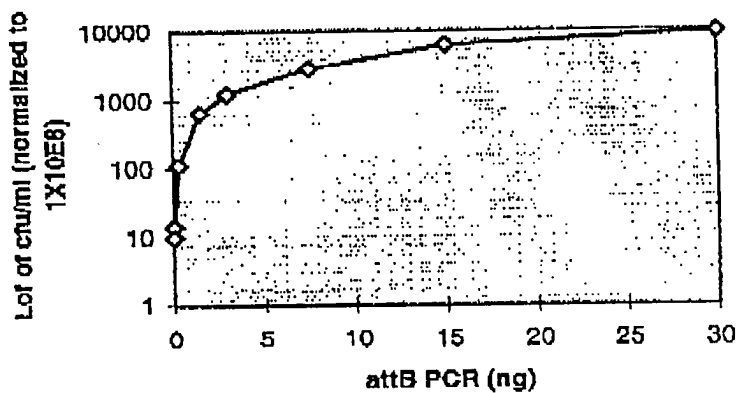
FIGURE 68

FIGURE
69

Titration of 256 bp PCR in Reaction BxP



Titration of 256 bp PCR in Reaction BxP



Efficiency of cloning of 256 bp PCR Into a Destination vector

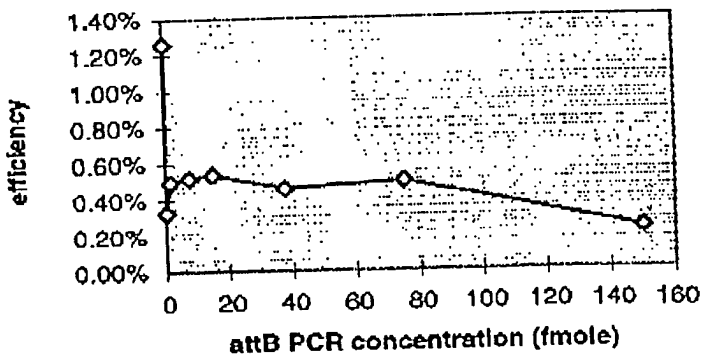
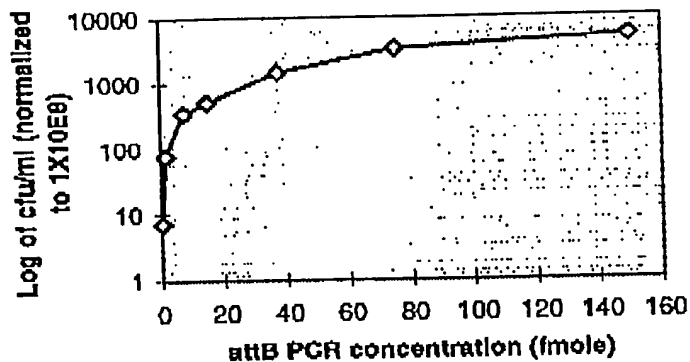


FIGURE
70

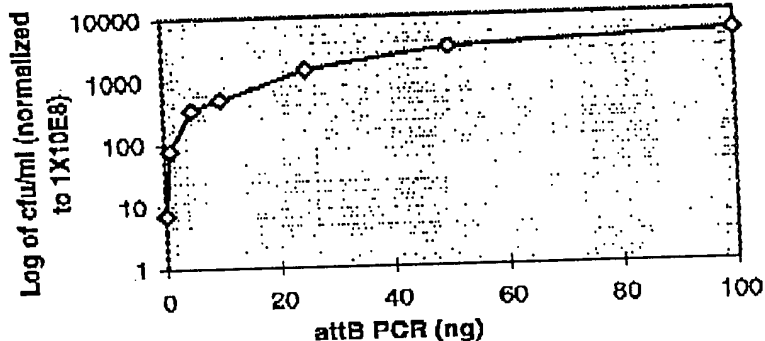
A

Titration of 1 kb PCR In Reaction BxP



B

Titration of 1 kb PCR In Reaction BxP



C

Efficiency of cloning of 1 kb PCR into a Destination vector

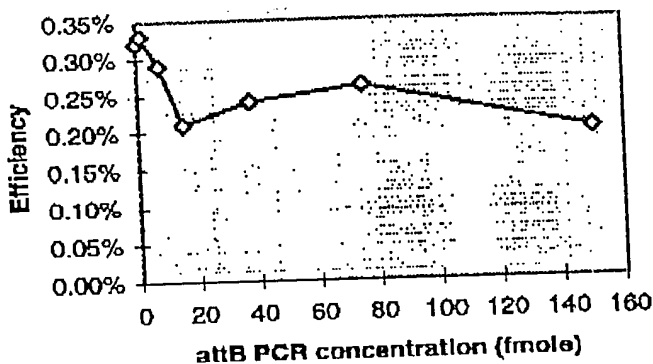
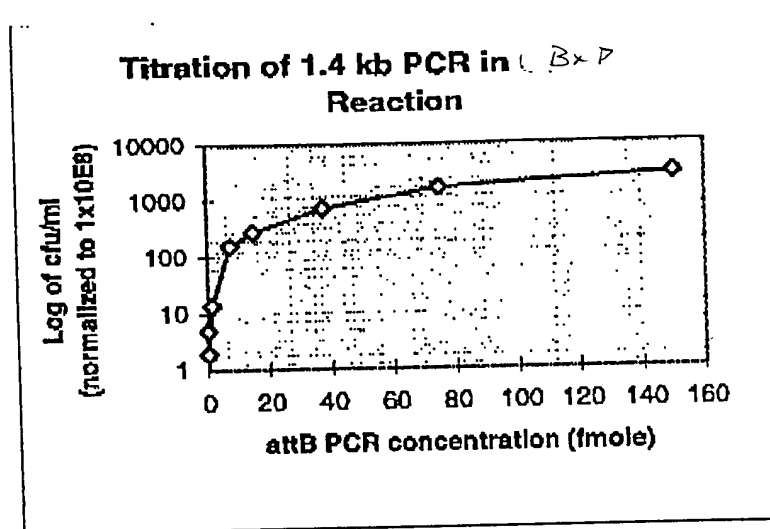
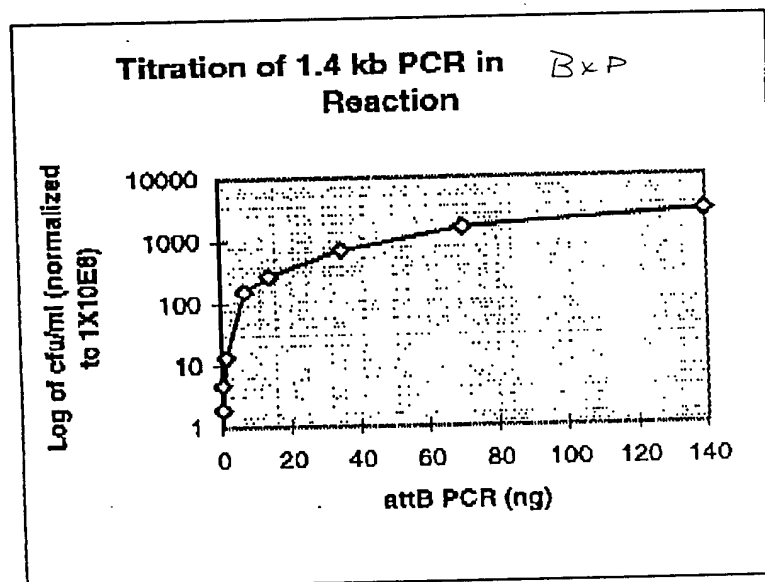


FIGURE 71

A



B



C

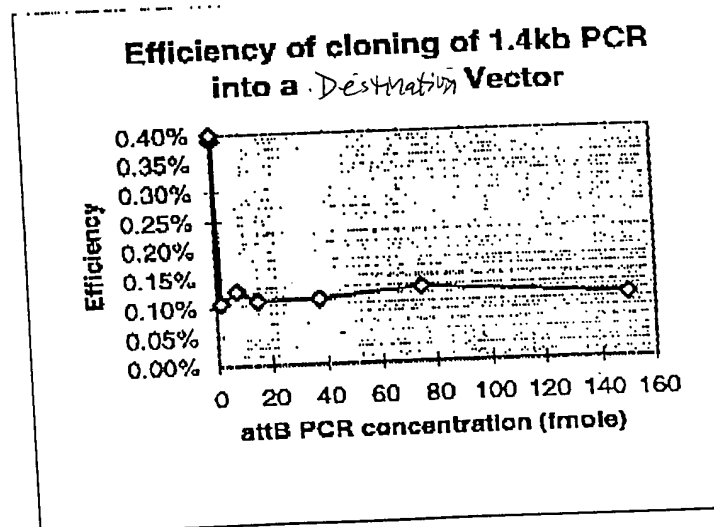
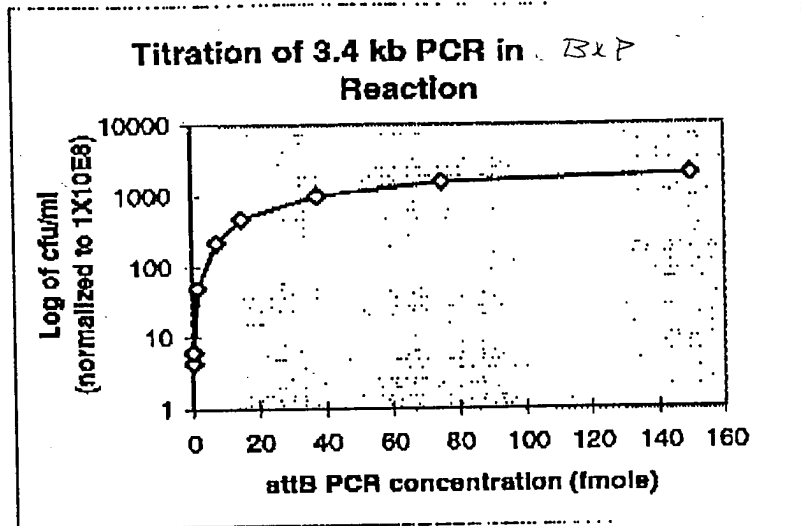
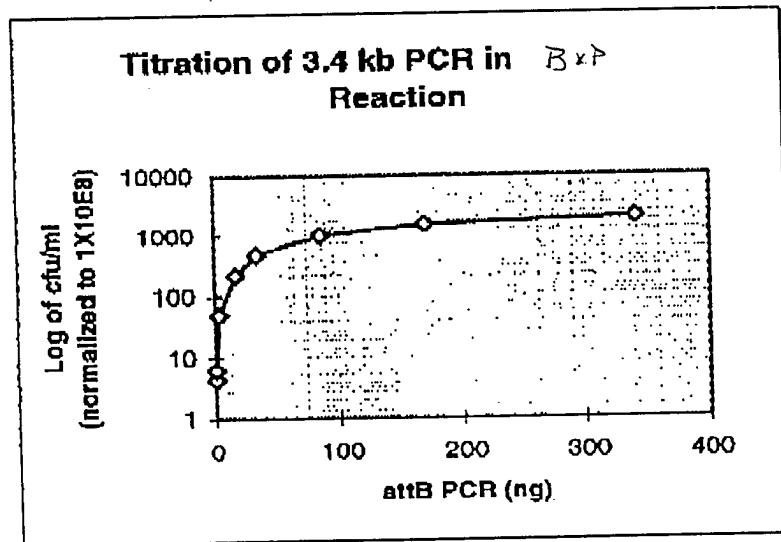


FIGURE 72

A



B



C

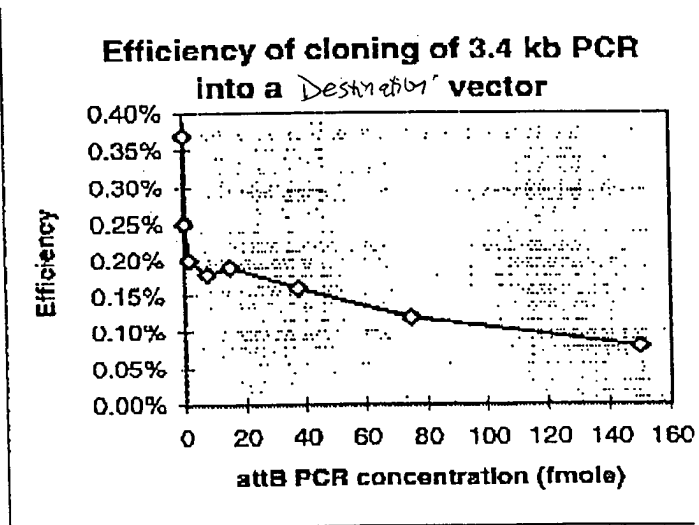
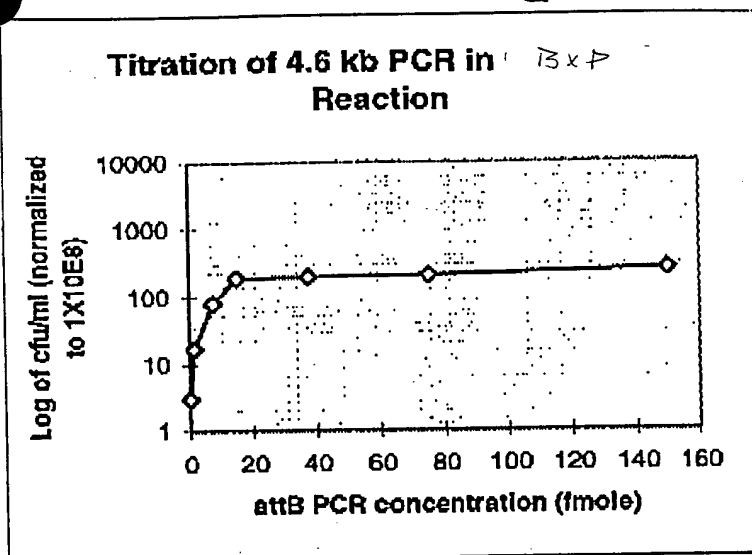
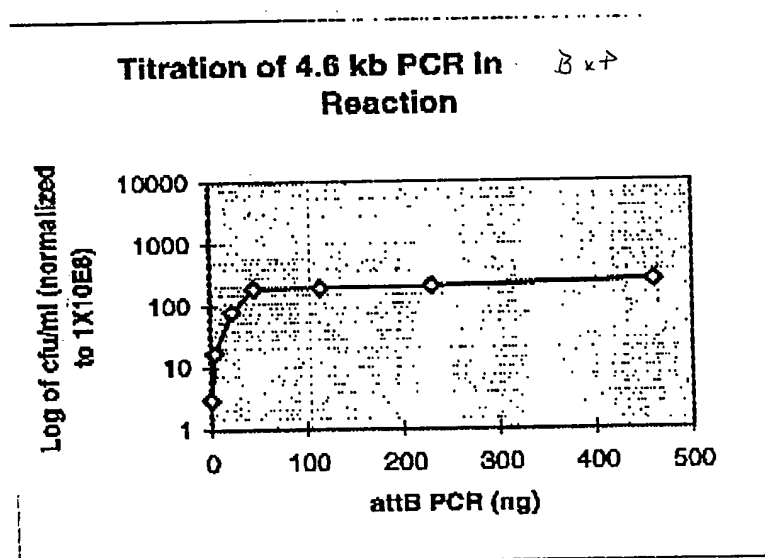


FIGURE 73

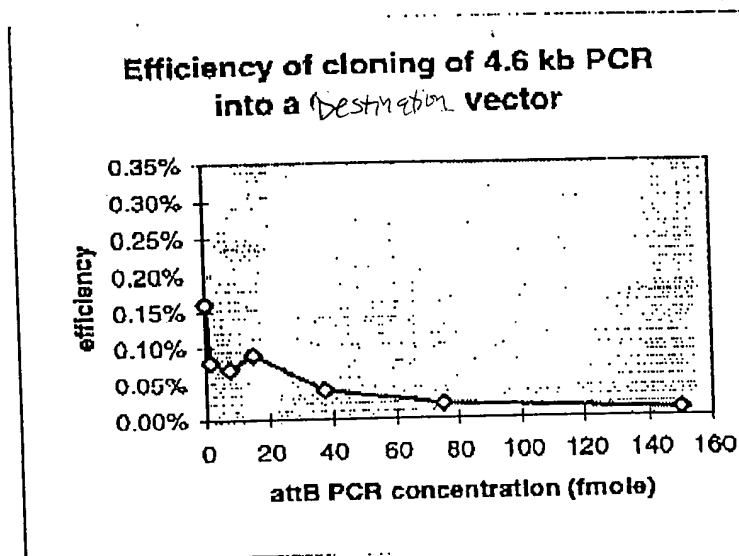
A



B



C



6.9 kb PCR DNA Titration in α BxP Reaction

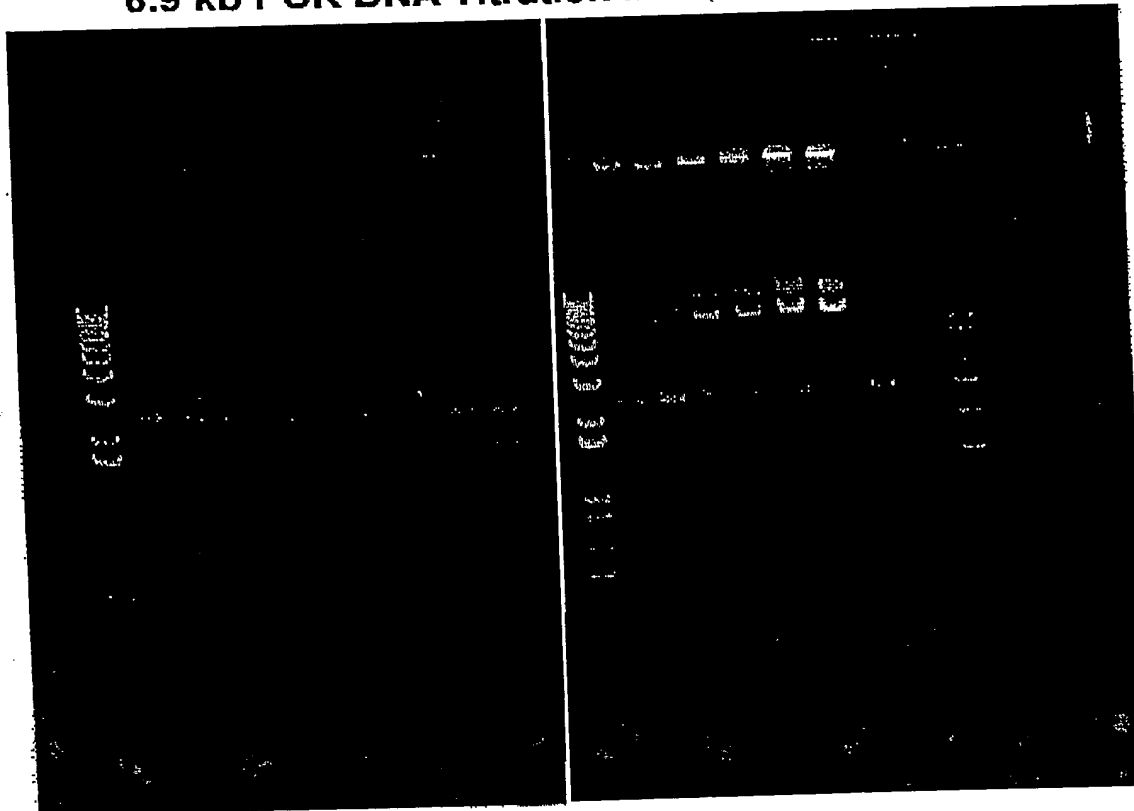


FIGURE 74

Titration of 10.1 kb PCR in *BxP* Reaction

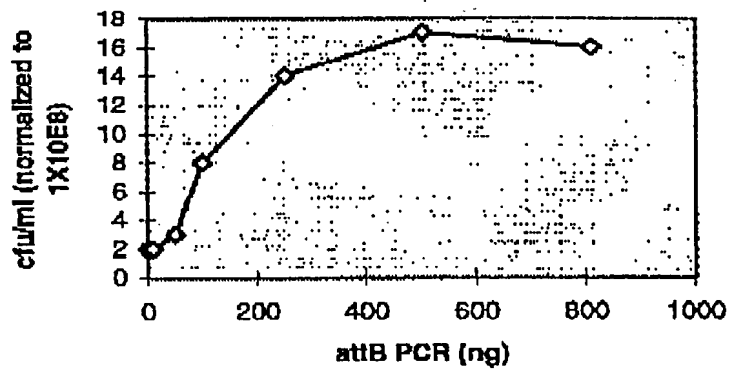


FIGURE 75-

10.1 kb PCR DNA Titration in Bx7 Reaction

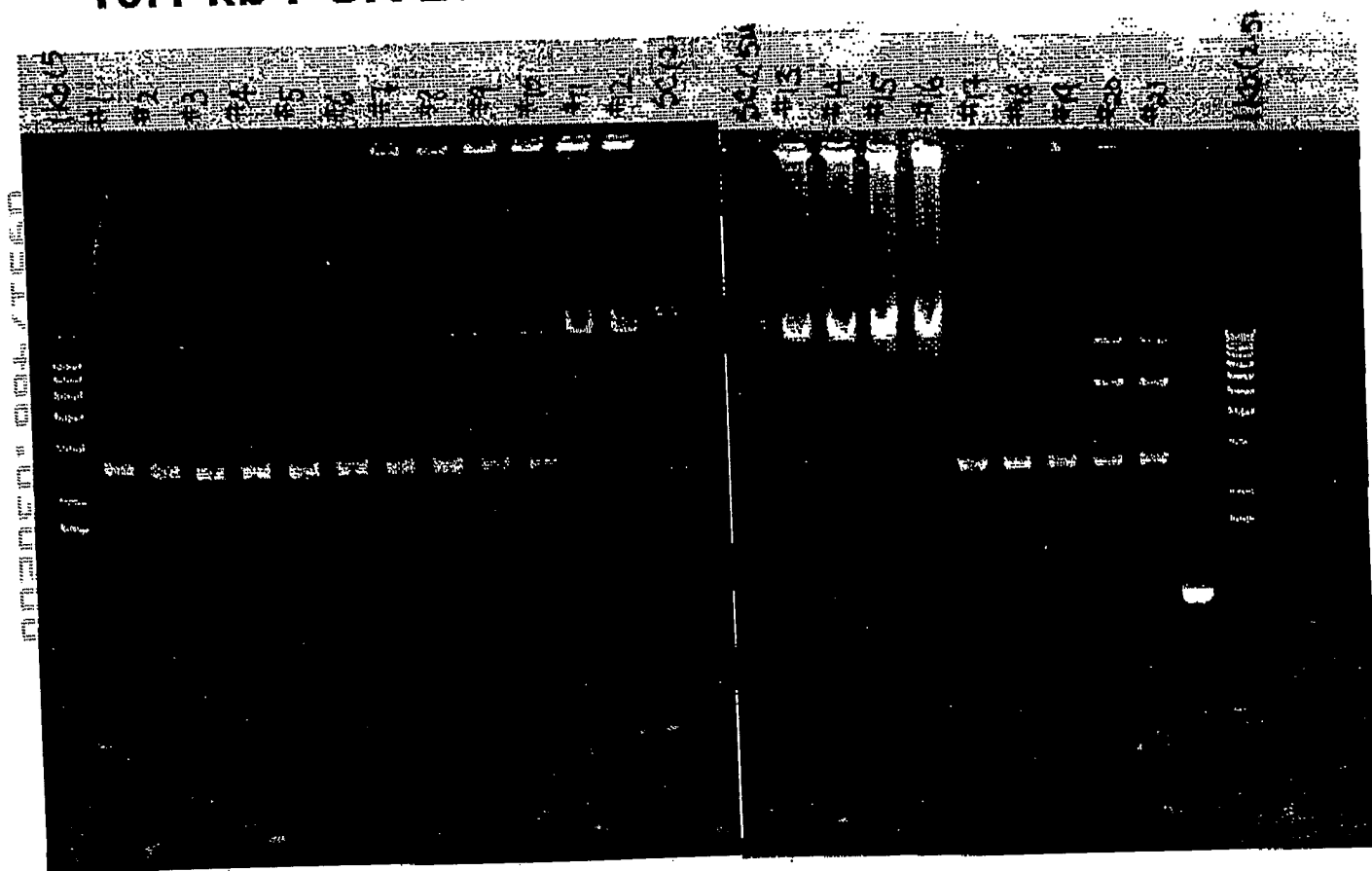


FIGURE 76

Cloning of PCR Products of Different Sizes with the GATEWAY™ PCR Cloning System

Size	fmols PCR DNA	ng PCR DNA	Cols/ml Transformation (pUC=10 ⁸ CFU/ml)	Correct Clones/Total Examined**
0.26 kb*	15	3	1223	10/10 (a)
	37.5	7.5	2815	
1.0 kb	15	10	507	49/50 (b)
	37.5	25	1447	
1.4 kb	15	14	271	48/50 (c)
	37.5	35	683	
3.4 kb	15	34	478	9/10 (a)
	37.5	85	976	
4.6 kb	15	46	190	10/10 (a)
	37.5	115	195	
6.9 kb	15	69	30 (235)**	47/50 (b)
	37.5	173	54 (463)**	

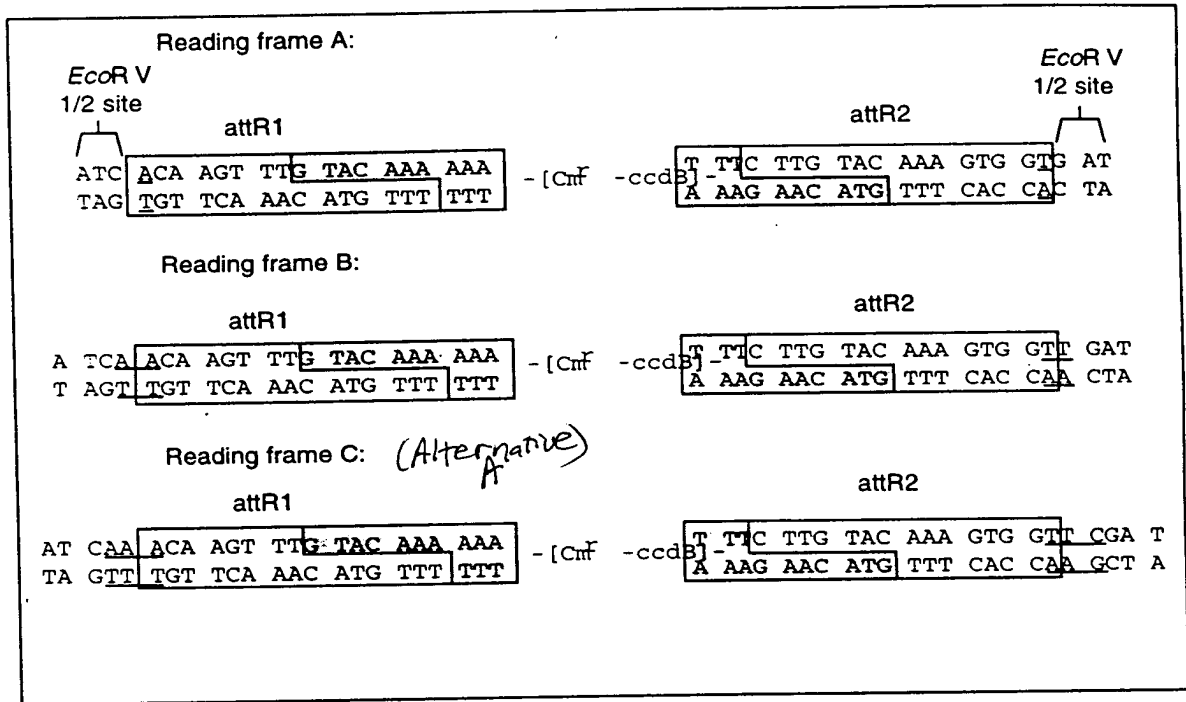
*The 0.26 kb PCR product was used unpurified; all the others were purified by precipitation with PEG/MgCl₂ as described in the text of Example 9, to remove primer dimers potentially present. Standard incubations were for 60 min.

**overnight incubation

- (a) DNA minipreps
- (b) ampR/kanR
- (c) tetR/kanR

Figure 77

002002 03471660



Reading frame C: (Alternative)
B

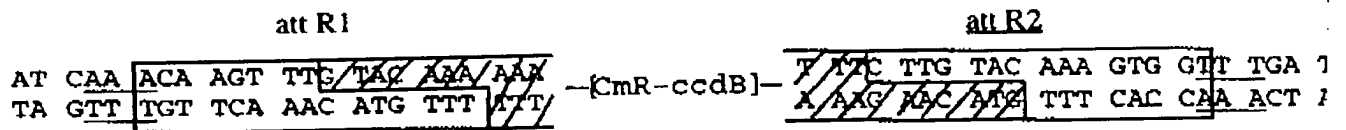


FIGURE 78

Reading frame A cassette

Reading frame B cassette

--- nnn nnn nna tca aca agt ttg tac aaa aaa gct ---

 --- nnn nnn nnt agt tgt tca aac atg ttt ttt cga ---

* cannot be TG or TA

Reading frame C cassette

--- nnn nnn nat caa aca agt ttg tac aaa aaa gct ---
 --- nnn nnn nta gtt tgt tca aac atg ttt ttt cga ---

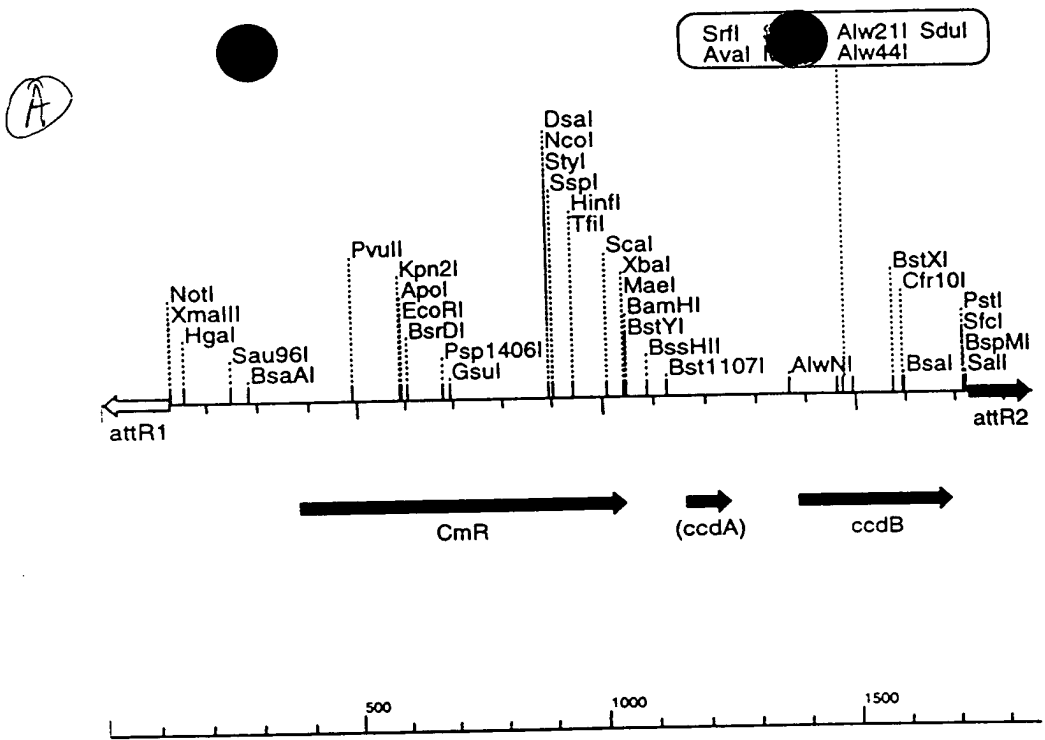
FIGURE 79

Restriction map of the pUC19 plasmid. The map shows a circular DNA molecule with various restriction sites labeled. A scale bar at the bottom indicates positions from 0 to 1500 base pairs. The map includes sites for NotI, XmaIII, BanI, PvuII, KpnII, ApoI, EcoRI, BsrDI, PspI, PstI, DsaI, NcoI, StyI, SspI, HinfI, TfiI, Scal, AflIII, MluI, BssHII, Bst1107I, BbvI, AlwNI, BsmFI, BstXI, Cfr10I, BsaI, PstI, SfiI, BspMI, SalI, and TaqI. A box at the top right lists sites: SrfI, SmaI, Alw21I, SduI, Aval, Maml, and Alw44I. Arrows indicate the direction of transcription for CmR, (ccdA), and ccdB.

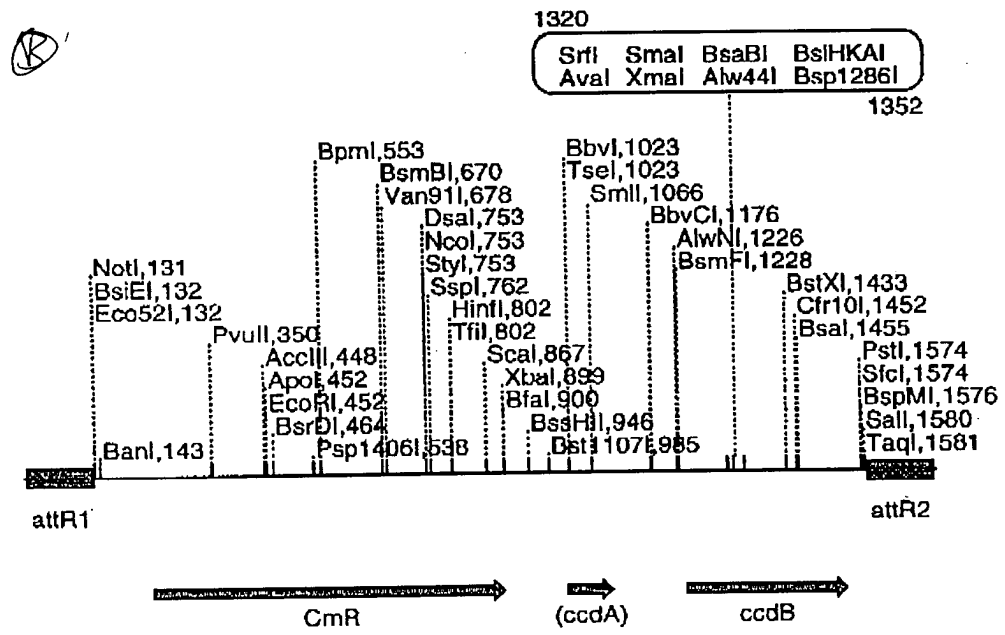
FIGURE 80

8

002050" 00421550



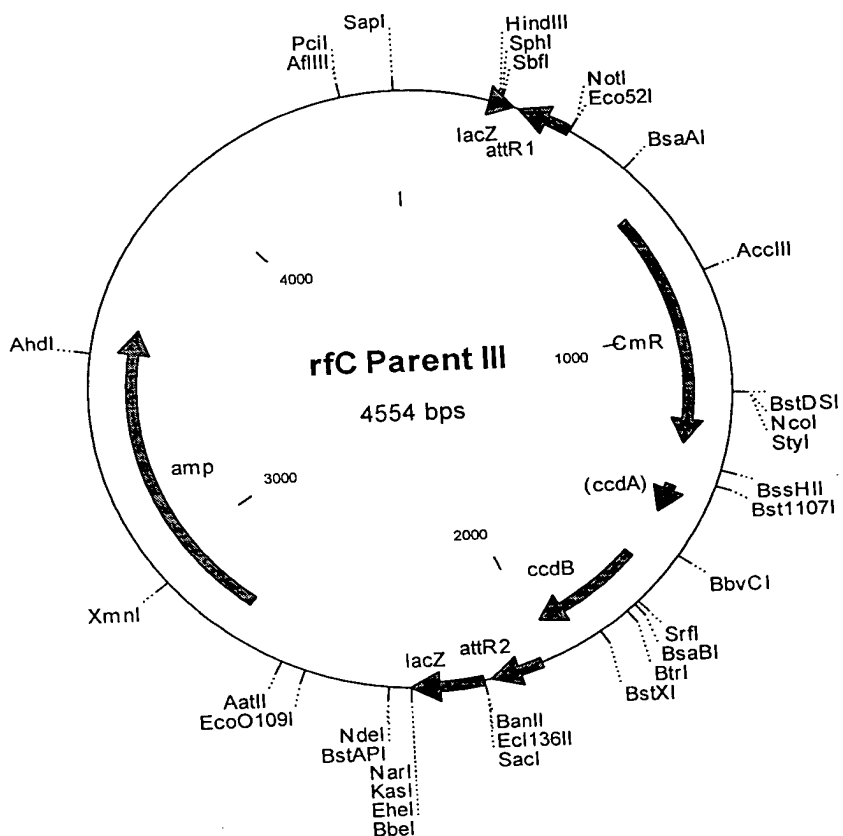
rfc Cassette (1856 bps)



rfc cassette (1715 bps)

FIGURE 82

FIGURE 83 A



prfC Parent III 4554 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
410..286	attR1
660..1319	CmR
1439..1523	inactivated ccdA
1661..1966	ccdB
2007..2131	attR2
2753..3613	amp

```

1 GCGCCCAATA CGCAAACCGC CTCTCCCCGC GCGTTGGCCG ATTCATTAAT GCAGCTGGCA
61 CGACAGGTTT CCCGACTGGA AAGCGGGCAG TGAGCGCAAC GCAATTAATG TGAGTTAGCT
121 CACTCATTAG GCACCCCAGG CTTTACACTT TATGCTTCCG GCTCGTATGT TGTGTGGAAT
181 TGTGAGCGGA TAACAATTTT ACACAGGAAA CAGCTATGAC CATGATTACG CCAAGCTTGC
241 ATGCCCTGCAG GTCGACTCTA GAGGATCCCC GGGTACCGAT ATCAAACAAG TTTGTACAAA
301 AAAGCTGAAC GAGAAACGTA AAATGATATA AATATCAATA TATTAAATTA GATTTTGCAT
361 AAAAAACAGA CTACATAATA CTGTAAAACA CAACATATCC AGTCACTATG GCGGCCGCTA
421 AGTTGGCAGC ATCACCCGAC GCACTTTGCG CCGAATAAAT ACCTGTGACG GAAGATCACT
481 TCGCAGAATA AATAAATCCT GGTGTCCCTG TTGATACCGG GAAGCCCTGG GCCAACTTTT
541 GGCGAAAATG AGACGTTGAT CGGCACGTAA GAGGTTCCAA CTTTCACCAT AATGAAATAA
601 GATCACTACC GGGCGTATTT TTTGAGTTAT CGAGATTTTC AGGAGCTAAG GAAGCTAAAA
661 TGGAGAAAAA AATCACTGGA TATACCACCG TTGATATATC CCAATGGCAT CGTAAAGAAC
721 ATTTTGAGGC ATTTTCAGTCA GTTGCTCAAT GTACCTATAA CCAGACCGTT CAGCTGGATA
781 TTACGGCCTT TTTAAAGACC GTAAAGAAAA ATAAGCACA GTTTTATCCG GCCTTTATTC
841 ACATTCTTGC CCGCCTGATG AATGCTCATC CGGAATTCCG TATGGCAATG AAAGACGGTG
901 AGCTGGTGAT ATGGGATAGT GTTACCCTTT GTTACACCGT TTTCCATGAG CAAACTGAAA
961 CGTTTTTCATC GCTCTGGAGT GAATACCACG ACGATTTCCT GCAGTTTCTA CACATATATT
1021 CGCAAGATGT GGGCTGTTAC GGTGAAAACC TGGCTATTT CCTTAAAGGG TTTATTGAGA
1081 ATATGTTTTT CGTCTCAGCC AATCCCTGGG TGAGTTTCAC CAGTTTTGAT TTAAACGTGG
1141 CCAATATGGA CAACTTCTTC GCCCCGTTT TCACCATGGG CAAATATTAT ACGCAAGGCG
1201 ACAAGGTGCT GATGCCGCTG GCGATTCAAG TTCATCATGC CGTCTGTGAT GGCTTCCATG
1261 TCGGCAGAAT GCTTAATGAA TTACAACAGT ACTGCGATGA GTGGCAGGGC GGGGCGTAAT
1321 CTAGAGGATC CGGCTTACTA AAAGCCAGAT AACAGTATGC GTATTTGCGC GCTGATTTT
1381 GCGGTATAAG AATATATACT GATATGTATA CCCGAAGTAT GTCAAAAAGA GGTGTGCTAT
1441 GAAGCAGCGT ATTACAGTGA CAGTTGACAG CGACAGCTAT CAGTTGCTCA AGGCATATAT
1501 GATGTCAATA TCTCCGGTCT GGTAAGCACA ACCATGCAGA ATGAAGCCCG TCGTCTGCGT
1561 GCCGAACGCT GGAAAGCGGA AAATCAGGAA GGGATGGCTG AGGTCGCCCC GTTTATTGAA
1621 ATGAACGGCT CTTTTGCTGA CGAGAACAGG GACTGGTGAA ATGCAGTTTA AGGTTTACAC
1681 CTATAAAAGA GAGAGCCGTT ATCGTCTGTT TGTGGATGTA CAGAGTGATA TTATTGACAC
1741 GCCCGGGCGA CGGATGGTGA TCCCCCTGGC CAGTGCACGT CTGCTGTCAG ATAAAGTCTC
1801 CCGTGAACCT TACCCGGTGG TGCATATCGG GGATGAAAGC TGGCGCATGA TGACCACCGA
1861 TATGGCCAGT GTGCCGGTCT CCGTTATCGG GGAAGAAGTG GCTGATCTCA GCCACCGCGA
1921 AAATGACATC AAAAACGCCA TTAACCTGAT GTTCTGGGGA ATATAAATGT CAGGCTCCGT
1981 TATACACAGC CAGTCTGCAG GTCGACCATA GTGACTGGAT ATGTTGTGTT TTACAGTATT
2041 ATGTAGTCTG TTTTTTATGC AAAATCTAAT TTAATATATT GATATTTATA TCATTTTACG
2101 TTTCTCGTTC AGCTTTCTTG TACAAAGTGG TTCGATATCG GTACCGAGCT CGAATTCAC
2161 GGCCGTCGTT TTACAACGTC GTGACTGGGA AAACCCTGGC GTTACCCAAC TTAATCGCCT
2221 TGCAGCACAT CCCCCTTTTC CCAGCTGGCG TAATAGCGAA GAGGCCCGCA CCGATCGCCC
2281 TTCCCAACAG TTGCGCAGCC TGAATGGCGA ATGGCGCCTG ATGCGGTATT TTCTCCTTAC
2341 GCATCTGTGC GGTATTTTAC ACCGCATATG GTGCACTCTC AGTACAATCT GCTCTGATGC
2401 CGCATAGTTA AGCCAGCCCC GACACCCGCC AACACCCGCT GACGCGCCCT GACGGGCTTG
2461 TCTGCTCCCG GCATCCGCTT ACAGACAAGC TGTGACCGTC TCCGGGAGCT GCATGTGTCA
2521 GAGGTTTTC CCGTCATCAC CGAAACGCGC GAGACGAAAG GGCCTCGTGA TACGCCTATT
2581 TTTATAGGTT AATGTCATGA TAATAATGGT TTCTTAGACG TCAGGTGGCA CTTTTCGGGG
2641 AAATGTGCGC GGAACCCCTA TTTGTTTATT TTTCTAAATA CATTCAAATA TGTATCCGCT
2701 CATGAGACAA TAACCCTGAT AAATGCTTCA ATAATATTGA AAAAGGAAGA GTATGAGTAT
2761 TCAACATTTT CGTGTGCGCC TTATTCCCTT TTTTGCGGCA TTTTGCCTTC CTGTTTTTGC -

```

Figure 83B

002090" 99477550

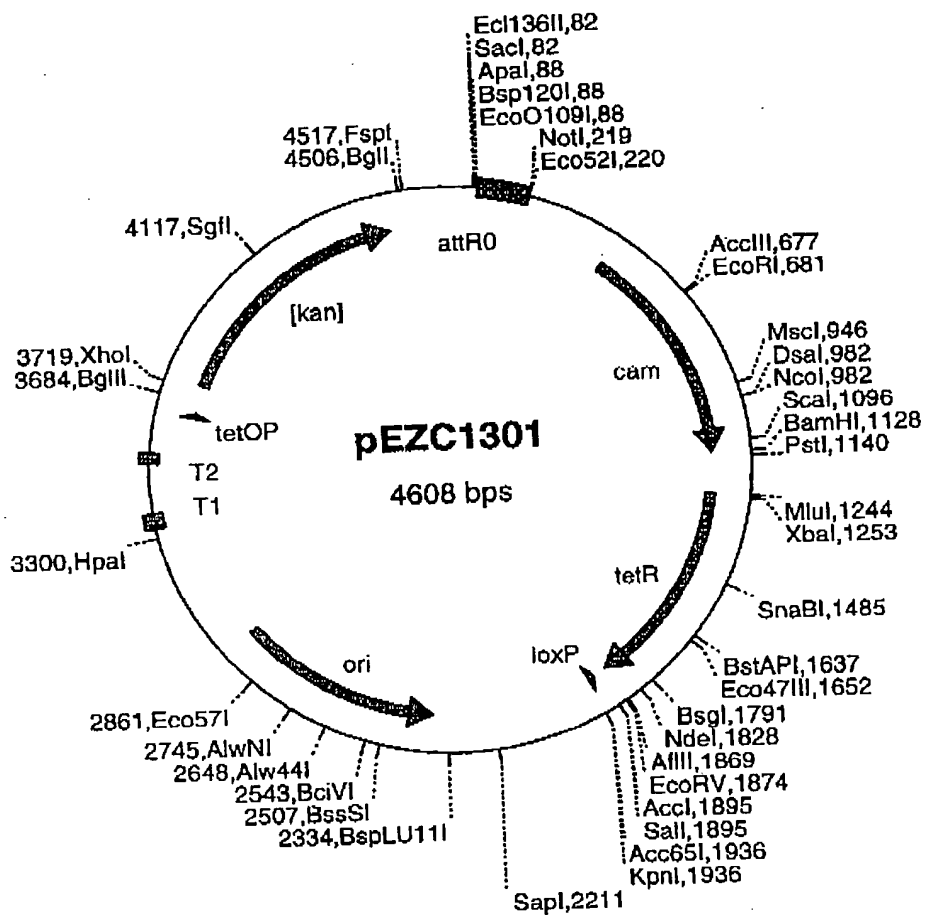


FIGURE 84

003060 0947560

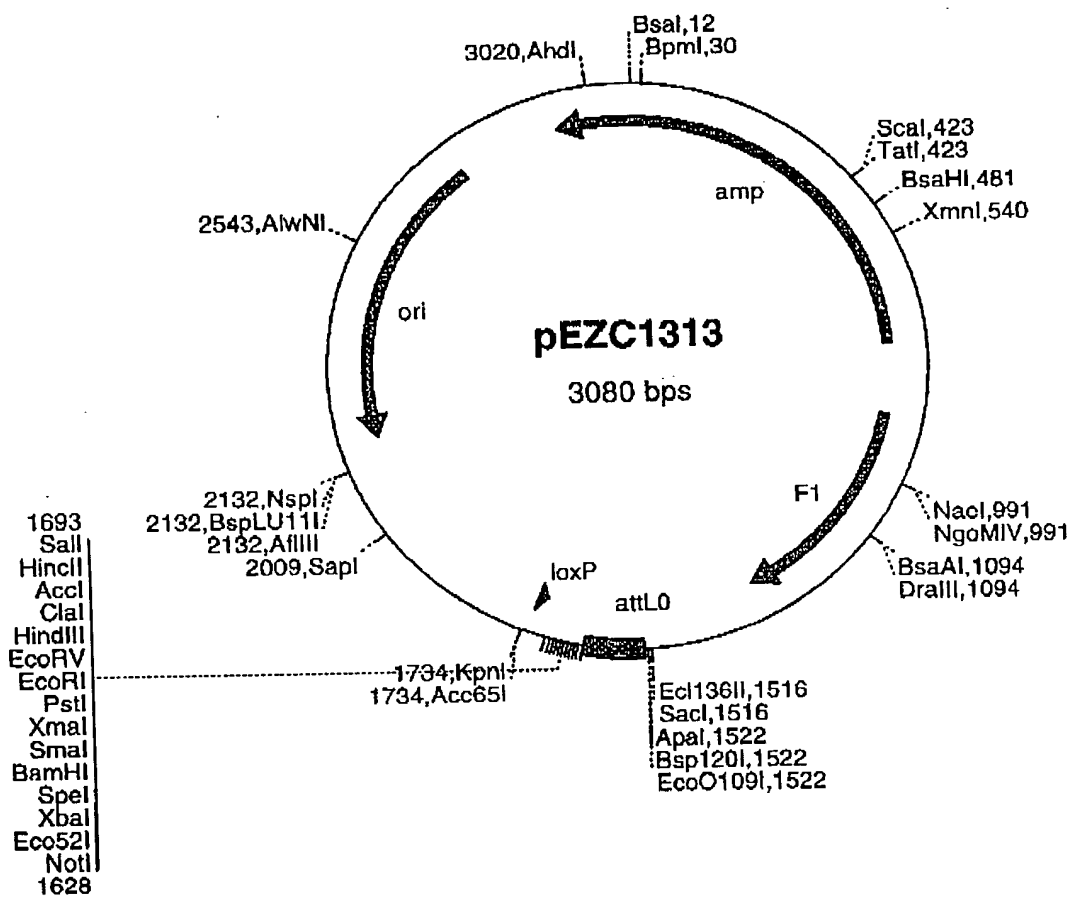


FIGURE 85

002030 004750 00547460 030300

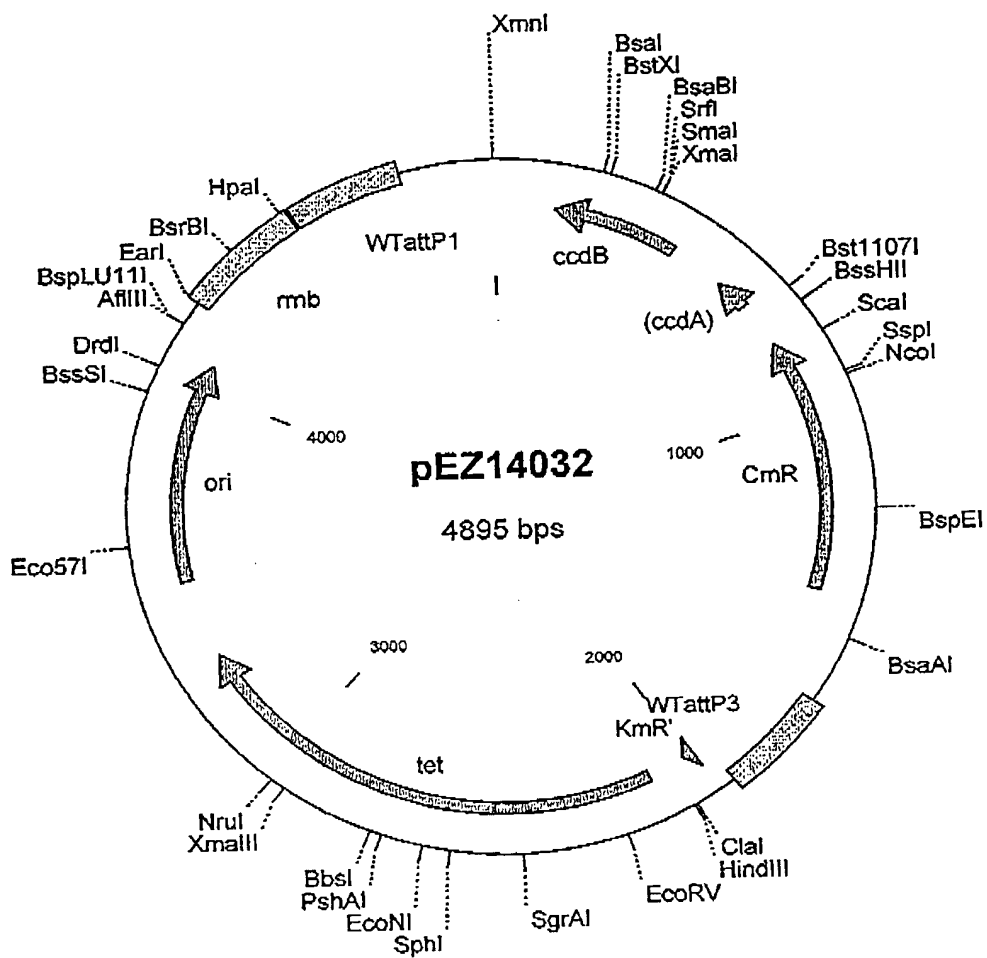
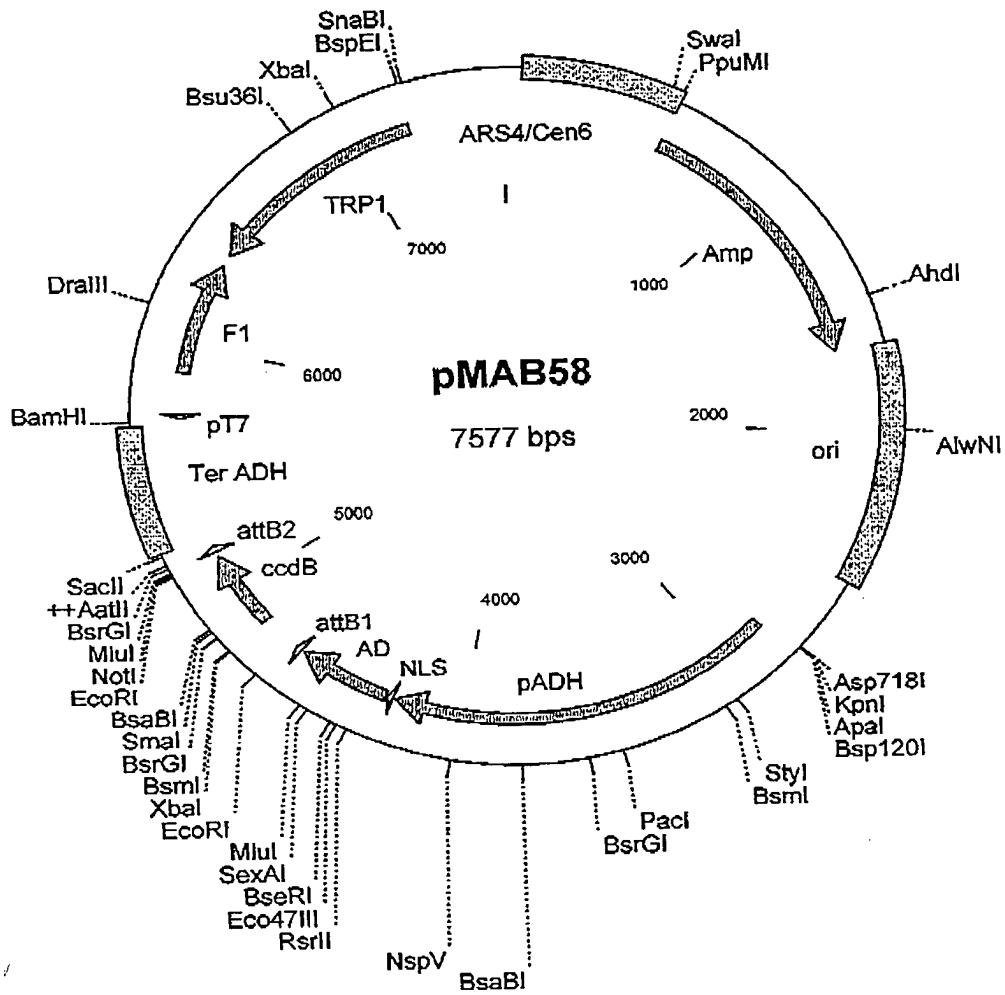


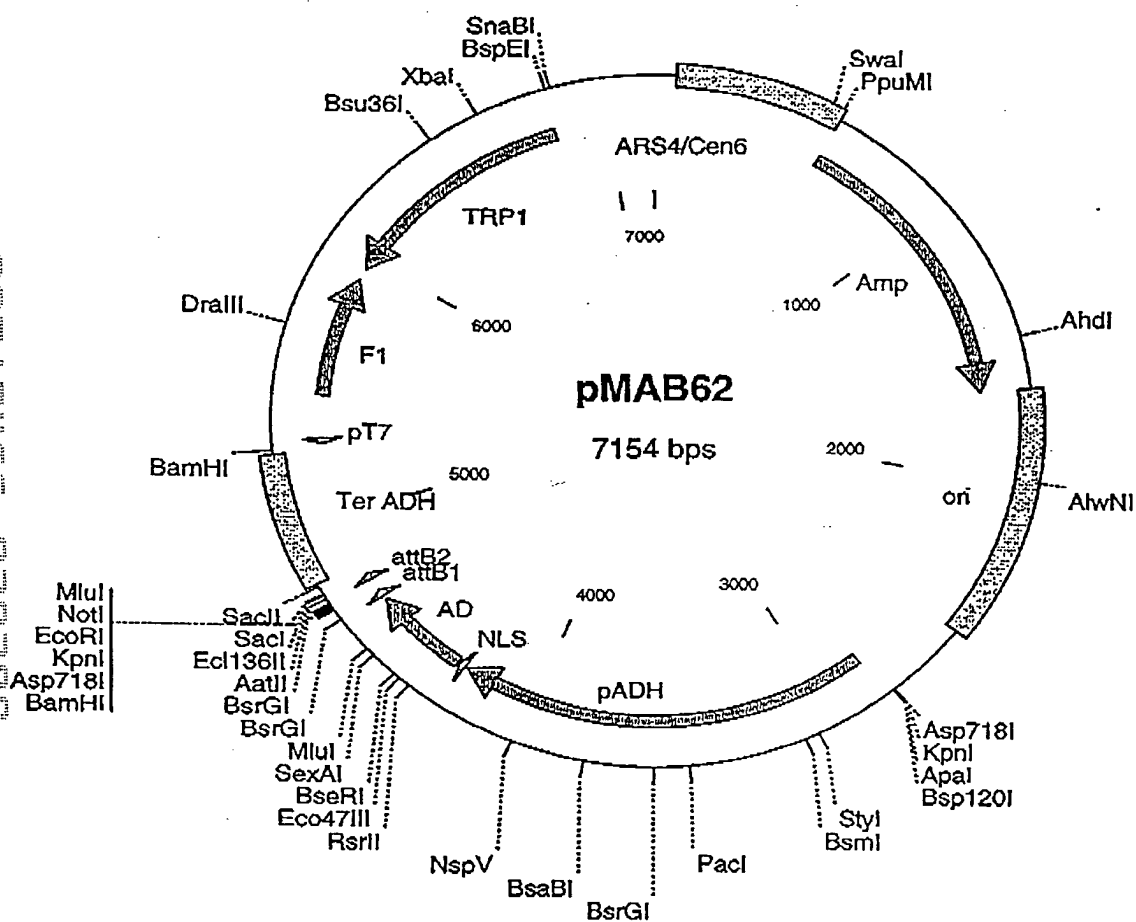
FIGURE 86

FIGURE 87



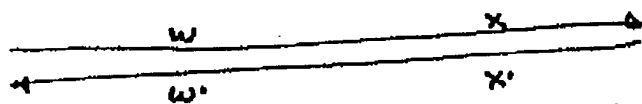
00347466-030300

THE

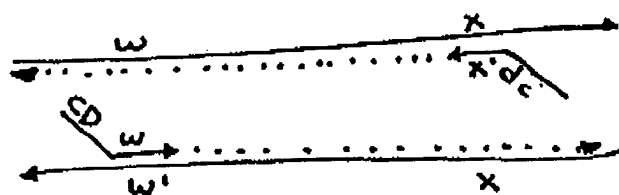


05517466.030200

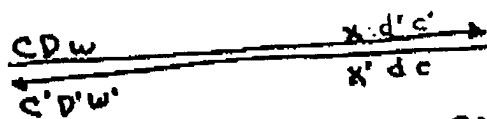
DNA to be amplified (5' → 3'):



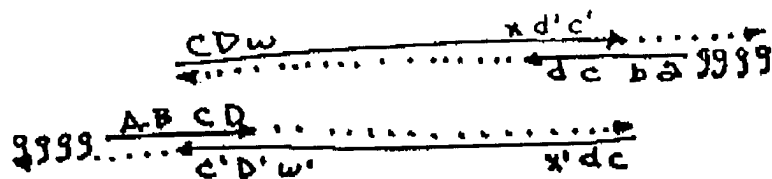
↓ Denature, anneal
hybrid primers,
↓ extend with polymerase



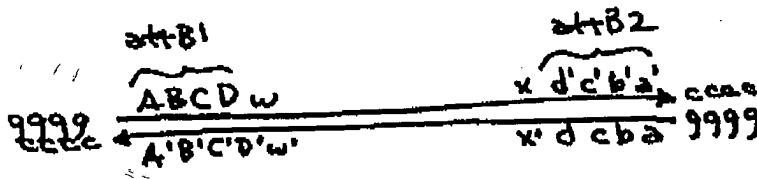
↓ amplification cycles



↓ Denature, anneal
attB primers,
extend with polymerase



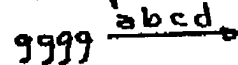
↓ amplification cycles



attB1 primer:



attB2 primer:



Hybrid primers (part
attB, part gene
specific):

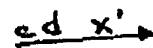


FIGURE 89

pDEST28
7141 bps

CMV promoter
attR1
Cmr
ccdB
attR2
T7 promoter
SV40 polyA
SV40 ori & early promoter
f1 intergenic region
Bsd^R
PA
Ap^R
ori

FIGURE 90A

ATGCATGTCGTTACATAACTTACGGTAAATGGCCCCGCTGGCTGACCGCCCAACGACCCC
CGCCCATTTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCAT
TGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTAT
CATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCCGCTGGCATTAT
GCCCAGTACATGACCTTATGGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATC
GCTATTACCATGGTGATGCGGTTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTGAC
TCACGGGGGATTTCCAAGTCTCCACCCCATTTGACGTCAATGGGAGTTTGTGTTTGGCACCA
AATCAACGGGACTTTCCAAAATGTCGTAACAACTCCGCCCCATTGACGCAAAATGGGCGGT
AGGCGTGACGGTGGGAGGTCTATATAAGCAGAGCTCTCCCTATCAGTGATAGAGATCTC
CCTATCAGTGATAGAGATCGTCGACGAGCTCGTTTAGTGAACCGTCAGATCGCCTGGAGA
CGCCATCCACGCTGTTTTGACCTCCATAGAAGACACCGGGACCGATCCAGCCTCCGGACT
CTAGAGGATCCCTACCGGTGATATCCTCGAGCCCATCAACAAGTTTGTACAAAAAAGCTG
AACGAGAAACGTAAAATGATATAAATATCAATATATTAAATTAGATTTTGCATAAAAAAC
AGACTACATAATACTGTAAAACACAACATATCCAGTCACTATGGCGGCCGATTAGGCAC
CCCAGGCTTTACACTTTATGCTTCCGGCTCGTATAATGTGTGGATTTTGTAGTTAGGATCC
GGCGAGATTTTCAGGAGCTAAGGAAGCTAAAATGGAGAAAAAATCACTGGATATACCAC
CGTTGATATATCCCAATGGCATCGTAAAGAACATTTTGTAGGCATTTTCAGTCAGTTGCTCA
ATGTACCTATAACCAGACCGTTTCAGCTGGATATTACGGCCTTTTTTAAAGACCGTAAAGAA
AAATAAGCACAAGTTTTATCCGGCCTTTATTACATTTCTTGCCCGCTGATGAATGCTCA
TCCGGAATTCGGTATGGCAATGAAAGACGGTGAGCTGGTGATATGGGATAGTGTTTACCC
TTGTTACACCGTTTTTCCATGAGCAAACGTTTTCATCGCTCTGGAGTGAATACCA
CGACGATTTCCGGCAGTTTCTACACATATATTTCGAAGATGTGGCGTGTTACGGTGAAAA
CCTGGCCTATTTCCCTAAAGGGTTTTATTGAGAATATGTTTTTTCGTCTCAGCCAATCCCTG
GGTGAGTTTACCAGTTTTGATTTAAACGTGGCCAATATGGACAACCTTCTTCCGCCCCGT
TTTACCATGGGCAATATTATACGCAAGGCGACAAGGTGCTGATGCCGCTGGCGATTCA
GGTTCATCATGCCGTCTGTGATGGCTTCCATGTCCGCAGAATGCTTAATGAATTACAACA
GTACTGCGATGAGTGGCAGGGCGGGCGTAAAGATCTGGATCCGGCTTACTAAAAGCCAG
ATAACAGTATGCGTATTTGCGCGCTGATTTTTGCGGTATAAGAATATATACTGATATGTA
TACCCGAAGTATGTCAAAAAGAGGTGTGCTATGAAGCAGCGTATTACAGTGACAGTTGAC
AGCGACAGCTATCAGTTGCTCAAGGCATATATGATGTCAATATCTCCGGTCTGGTAAGCA
CAACCATGCAGAATGAAGCCCGTCTGCGTGCCGAACGCTGGAAAGCGGAAATCAGG
AAGGGATGGCTGAGGTGCGCCGGTTTTATTGAAATGAACGGCTCTTTTGCTGACGAGAACA
GGGACTGGTGAAATGCAGTTTAAAGTTTTACACCTATAAAAGAGAGAGCCGTTATCGTCTG
TTTGTGGATGTACAGAGTGATATTATTGACACGCCCCGGGCGACGGATGGTGATCCCCCTG
GCCAGTGACGCTCTGCTGTGATATAAGTCTCCCGTGAACCTTTACCCGGTGGTGATATC
GGGGATGAAAGCTGGCGCATGATGACCACCGATATGGCCAGTGTGCCGGTCTCCGTTATC
GGGGAAGAAGTGGCTGATCTCAGCCACCGCGAAAATGACATCAAAAACGCCATTAACCTG
ATGTTCTGGGGAATATAAATGTGAGGCTCCCTTATACACAGCCAGTCTGCAGGTGACCA
TAGTGACTGGATATGTTGTGTTTTACAGTATTATGTAGTCTGTTTTTTATGCAAAATCTA
ATTTAATATATTGATATTTATATCATTTTACGTTTTCTCGTTTCAGCTTTCTTGTACAAAGT
GGTTGATGGGCGGCCGCTCTAGAGGGCCCAAGCTTACGCGTGATGCGACGTCATAGCTC
TCTCCCTATAGTGAGTCGTATTATAAGCTAGGCACTGGCCGTCGTTTTTACAACGTCGTGA
CTGGGAAAACCTGCTAGCTTGGGATCTTTGTGAAGGAACCTTACTTCTGTGGTGTGACATA
ATTGGACAAACTACCTACAGAGATTTAAAGCTCTAAGGTAAATATAAAATTTTTAAGTGT
ATAATGTGTTAAACTAGCTGCATATGCTTGTGCTTGAAGTTTTGCTTACTGAGTATGA
TTTATGAAAATATTATACACAGGAGCTAGTGATTCTAATTGTTTGTGATTTTAGATTCA
CAGTCCCAAGGCTCATTTTCAAGCCCCCTCAGTCTCACAGTCTGTTTATGATCATAATCAG
CCATACCACATTTGTAGAGGTTTTACTTGCTTTAAAAAACCTCCACACCTCCCCCTGAA
CCTGAAACATAAAATGAATGCAATTGTTGTTGTTAACTTGTGTTTATGACGCTTATAATGG
TTACAAATAAAGCAATAGCATCACAATTTTCAAAATAAAGCATTTTTTTTCACTGCATTCT
TAGTTGTGGTTTGTCCAAACTCATCAATGTATCTTATCATGTCTGGATCGATCCTGCATT
AATGAATCGGCCAACGCGCGGGGAGAGCGGTTTGGCTATTGGCTGGCGTAATAGCGAAG
AGGCCCCGACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGGACGCGC
CCTGTAGCGGCGCATTAAGCGCGGGGTTGTGGTGGTTACGCGCAGCGTGACCGCTACAC
TTGCCAGCGCCCTAGCGCCGCTCCTTTTCGTTTTCTTCCCTTCTTCTCGCCACGTTTCG
CCGGCTTTCCCGCTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTAGTGCTT-

Figure 90B

CGCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCGCCTCTCCCC
GCGCGTTGGCCGATTCATTAATGCAGAGCTTGCAATTCGCGCGTTTTTCAATATTATTGA
AGCATTTATCAGGGTTATTGTCTCATGAGCGGATACATATTTGAATGTATTTAGAAAAAT
AAACAAATAGGGGTTCCGCGCACATTTCCCCGAAAAGTGCCACCTGACGTCTAAGAAACC
ATTATTATCATGACATTAACCTATAAAAAATAGGCGTAGTACGAGGCCCTTCACTCATTA
G

FIGURE 90D

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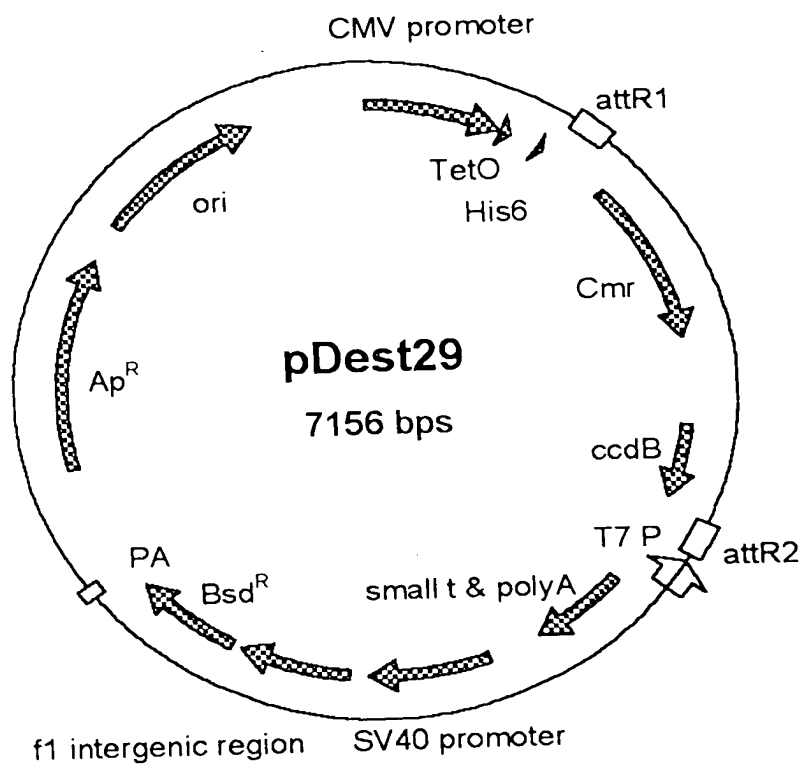


FIGURE 91 A

ATGCATGTCGTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACCCC
CGCCCATTTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCAT
TGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTAT
CATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCCTGGCATTAT
GCCCAGTACATGACCTTATGGGACTTTCTACTTGGCAGTACATCTACGTATTAGTCATC
GCTATTACCATGGTGATGCGGTTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTTGAC
TCACGGGGATTTCCAAGTCTCCACCCCATTTGACGTCAATGGGAGTTTTGTTTTGGCACCA
AATCAACGGGACTTTCCAAAATGTCGTAACAACTCCGCCCCATTGACGCAAATGGGCGGT
AGGCGTGACGGTGGGAGGTCTATATAAGCAGAGCTCTCCCTATCAGTGATAGAGATCTC
CCTATCAGTGATAGAGATCGTCGACGAGCTCGTTTTAGTGAACCGTCAGATCGCCTGGAGA
CGCCATCCACGCTGTTTTGACCTCCATAGAAGACACCGGGACCGATCCAGCCTCCGGACC
ATGGCGTACTACCATCACCATCACCATCACACCGGTGATATCCTCGAGCCCATCACAAGT
TTGTACAAAAAAGCTGAACGAGAAACGTAATAATGATATAAAATATCAATATATTAAATTAG
ATTTTGCATAAAAAACAGACTACATAACTGTAAACACAACATATCCAGTCACTATGG
CGGCCGCATTAGGCACCCCAAGGCTTTACACTTTATGCTTCCGGCTCGTATAATGTGTGGA
TTTTGAGTTAGGATCCGGCGAGATTTTCAGGAGCTAAGGAAGCTAAAATGGAGAAAAAA
TCACTGGATATACCACCGTTGATATATCCCAATGGCATCGTAAAGAACATTTTGAGGCAT
TTCAGTCAGTTGCTCAATGTACCTATAACCAGACCGTTTCAGCTGGATATTACGGCCTTTT
TAAAGACCGTAAAGAAAAATAAGCACAGTTTTATCCGGCCTTTATTACATTTCTTGCCC
GCCTGATGAATGCTCATCCGGAATTCGTATGGCAATGAAAGACGGTGAGCTGGTGATAT
GGGATAGTGTTACCCCTTGTTACACCGTTTTCCATGAGCAAACGTTTTCATCGC
TCTGGAGTGAATACCACGACGATTTCCGGCAGTTTCTACACATATATTGCAAGATGTGG
CGTGTTACGGTGAAAACCTGGCCTATTTCCCTAAAGGGTTTATTGAGAATATGTTTTCG
TCTCAGCCAATCCCTGGGTGAGTTTTCACAGTTTGTATTTAAACGTGGCCAATATGGACA
ACTTCTTCGCCCCCGTTTTTACCATGGGCAAATATTATACGCAAGGCGACAAGGTGCTGA
TGCCGCTGGCGATTTCAGGTTTCATCATGCGGTCTGTGATGGCTTCCATGTCGGCAGAATGC
TTAATGAATTACAACAGTACTGCGATGAGTGGCGAGGGCGGGCGTAAACGCGTGATCCG
GCTTACTAAAAGCCAGATAACAGTATGCGTATTTGCGCGCTGATTTTTGCGGTATAAGAA
TATATACTGATATGTATACCCGAAGTATGTCAAAAAGAGGTGTGCTATGAAGCAGCGTAT
TACAGTGACAGTTGACAGCGACAGCTATCAGTTGCTCAAGGCATATATGATGTCAATATC
TCCGGTCTGGTAAGCACAAACCATGCAGAATGAAGCCCGTCTGCTGCGTGCCGAACGCTGG
AAAGCGGAAAATCAGGAAGGGATGGCTGAGGTGCGCCCGGTTTATTGAAATGAACGGCTCT
TTTGCTGACGAGAACAGGGACTGGTGAAATGCAGTTTAAAGTTTACACCTATAAAAGAGA
GAGCCGTTATCGTCTGTTTGTGGATGTACAGAGTGATATTATTGACACGCCCCGGCGACG
GATGGTGATCCCCCTGGCCAGTGACAGTCTGCTGTGATGATAAAGTCTCCCGTGAACTTTA
CCCGGTGGTGATATCGGGGATGAAAGCTGGCGCATGATGACCACCGATATGGCAGTGT
GCCGGTCTCCGTTATCGGGGAAGAAGTGGCTGATCTCAGCCACCGCGAAAATGACATCAA
AAACGCCATTAACTGATGTTCTGGGGAATATAAATGTGCTAGGCTCCGTTATACACAGCCA
GTCTGCAGGTGCGACCATAGTGACTGGATATGTTGTGTTTTACAGTATTATGTAGTCTGTT
TTTTATGCAAAATCTAATTTAATATATTGATATTTATATCATTTTACGTTTCTCGTTTACG
CGACGTATAGCTCTCTCCCTATAGTGAGTCGTATTATAAGCTAGGCACTGGCCGTCGT
TTTACAACGTCGTGACTGGGAAAACGCTAGCTTGGGATCTTTGTGAAGGAACCTTACTT
CTGTGGTGTGACATAATTGGACAACTACCTACAGAGATTTAAAGCTCTAAGGTAAATAT
AAAATTTTTAAGTGTATAATGTGTTAACTAGCTGCATATGCTTGCTGCTTGAGAGTTTT
GCTTACTGAGTATGATTTATGAAAATATTATACACAGGAGCTAGTGATTCTAATTGTTTG
TGTATTTTAGATTACAGTCCCAAGGCTCATTTTCAGGCCCCCTCAGTCCTCACAGTCTGTT
CATGATCATAATCAGCCATACCACATTTGTAGAGGTTTTACTTTGCTTTAAAAAACCTCCC
ACACCTCCCCCTGAACCTGAAACATAAAATGAATGCAATTGTTGTTGTTAACTTGTTTAT
TGCAGCTTATAATGGTTACAAATAAAGCAATAGCATCACAAATTTCAAAATAAAGCATT
TTTTTCACTGCATTCTAGTTGTGTTTTGTCCTCAAACTCATCAATGTATCTTATCATGTCTG
GATCGATCCTGCATTAATGAATCGGCCAACGCGCGGGGAGAGGCGGTTTTGCGTATTGGCT
GGCGTAATAGCGAAGAGGCCCGACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATG
GCGAATGGGACGCGCCCTGTAGCGGCGCATTAAAGCGCGCGGGGTGTGGTGGTTACGCGCA
GCGTGACCGCTACACTTGCCAGCGCCCTAGCGCCCGCTCCTTTCGCTTTCTTCCCTTCCT
TTCTCGCCACGTTTCGCCGGCTTTCCCGCTCAAGCTCTAATCGGGGGCTCCCTTTAGGGT-

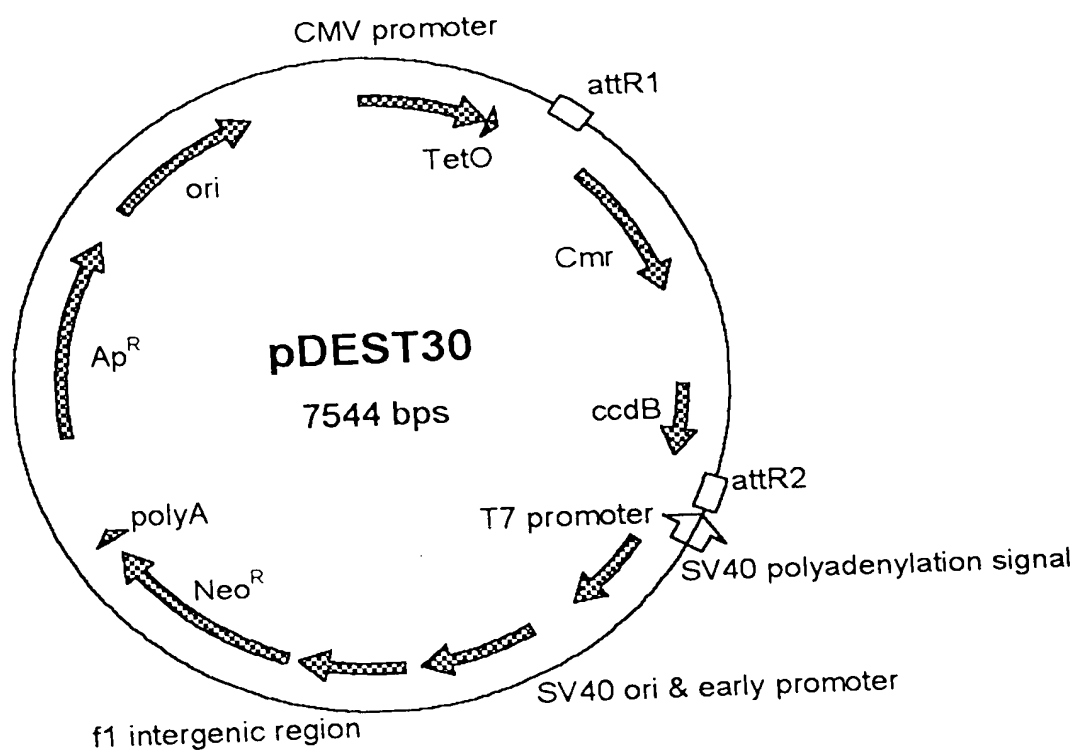
FIGURE 91B

AGCCGAACGACCGAGCGCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCCAATACGC
AAACCGCCTCTCCCCGCGCGTTGGCCGATTCATTAATGCAGAGCTTGCAATTCGCGCGTT
TTTCAATATTATTGAAGCATTTATCAGGGTTATTGTCTCATGAGCGGATACATATTTGAA
TGTATTTAGAAAAATAAACAAATAGGGGTTCGCGCACATTTCCCCGAAAAGTGCCACCT
GACGTCTAAGAAACCATTATTATCATGACATTAACCTATAAAAATAGGCGTAGTACGAGG
CCCTTTCATCATTAG

003050-03050

FIGURE 91D

FIGURE 92A



ATGCATGTCGTTACATAACTTACGGTAAATGGCCCGCCTGGCTGACCGCCCAACGACCCC
CGCCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCAT
TGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTAT
CATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCGCCTGGCATTAT
GCCCAGTACATGACCTTATGGGACTTTCTCTACTTGGCAGTACATCTACGTATTAGTCATC
GCTATTACCATGGTGTATGCGGTTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTTGAC
TCACGGGGATTTCCAAGTCTCCACCCATTGACGTCAATGGGAGTTTTGTTTTTGGCACCAA
AATCAACGGGACTTTCCAAAATGTCTGTAACAACTCCGCCCCATTGACGCAAATGGGCGGT
AGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTCTCCCTATCAGTGATAGAGATCTC
CCTATCAGTGATAGAGATCGTCGACGAGCTCGTTTTAGTGAACCGTCAGATCGCCTGGAGA
CGCCATCCACGCTGTTTTGACCTCCATAGAAGACACCGGGACCGATCCAGCCTCCGGACT
CTAGAGGATCCCTACCGGTGATATCCTCGAGCCCATCAACAAGTTTGTACAAAAAAGCTG
AACGAGAAACGTAAAATGATATAAATATCAATATATTAAATTAGATTTTGCATAAAAAAC
AGACTACATAATACTGTAAAACACAACATATCCAGTCACTATGGCGGCCCGATTAGGCAC
CCCAGGCTTTACACTTTATGCTTCCGGCTCGTATAATGTGTGGATTTTGTAGTTAGGATCC
GGCGAGATTTTCAGGAGCTAAGGAAGCTAAAATGGAGAAAAAATCACTGGATATACCAC
CGTTGATATATCCCAATGGCATCGTAAAGAACATTTTGTAGGCATTTTCAGTCAGTTGCTCA
ATGTACCTATAACCAGACCGTTTCAGCTGGATATTACGGCCTTTTTTAAAGACCGTAAAGAA
AAATAAGCACAAAGTTTTATCCGGCCTTTATTACATTCTTGCCCGCCTGATGAATGCTCA
TCCGGAATTCGGTATGGCAATGAAAGACGGTGAGCTGGTGATATGGGATAGTGTTACCCC
TTGTTACACCGTTTTTCCATGAGCAAACGTAAACGTTTTTCATCGCTCTGGAGTGAATACCA
CGACGATTTCCGGCAGTTTCTACACATATATTGCAAGATGTGGCGTGTTACGGTGAAAA
CCTGGCCTATTTCCCTAAAGGGTTTTATTGAGAATATGTTTTTCGTCTCAGCCAATCCCTG
GGTGAGTTTACCAGTTTTGATTTAAACGTGGCCAATATGGACAACCTCTTCGCCCCGT
TTTACCATGGGCAAAATATTATACGCAAGGCGACAAGGTGCTGATGCCGCTGGCGATTCA
GGTTCATCATGCCGTCTGTGATGGCTTCCATGTGCGCAGAATGCTTAATGAATTACAACA
GTACTGCGATGAGTGGCAGGGCGGGCGTAAAGATCTGGATCCGGCTTACTAAAAGCCAG
ATAACAGTATGCGTATTTGCGCGCTGATTTTTGCGGTATAAGAATATATACTGATATGTA
TACCCGAAGTATGTCAAAAAGAGGTGTGCTATGAAGCAGCGTATTACAGTGACAGTTGAC
AGCGACAGCTATCAGTTGCTCAAGGCATATATGATGTCAATATCTCCGGTCTGGTAAGCA
CAACCATGCAGAAATGAAGCCCGTCTGCTGCGTGCCGAACGCTGGAAAGCGGAAAATCAGG
AAGGGATGGCTGAGGTGCCCCGTTTTATTGAAATGAACGGCTCTTTTGTGCTGACGAGAACA
GGGACTGGTGAAATGCAGTTTAAAGGTTTACACCTATAAAAGAGAGAGCCGTTATCGTCTG
TTTGTGGATGTACAGAGTGATATTATTGACACGCCCCGGCGACGGATGGTGATCCCCCTG
GCCAGTGCACGTCTGCTGTGAGATAAAGTCTCCCGTGAACCTTTACCCGGTGGTGATATC
GGGGATGAAAGCTGGCGCATGATGACCACCGATATGGCCAGTGTGCCGCTCTCCGTTATC
GGGGAAGAAGTGGCTGATCTCAGCCACCGCGAAAATGACATCAAAAACGCCATTAACCTG
ATGTTCTGGGGAATATAAATGTGAGGCTCCCTTATACACAGCCAGTCTGCAGTTCGACCA
TAGTGACTGGATATGTTGTGTTTTACAGTATTATGTAGTCTGTTTTTTATGCAAAATCTA
ATTTAATATATTGATATTTATATCATTTTTACGTTTTCTCGTTCAGCTTTCTTGTACAAAGT
GGTTGATGGGCGGCCGCTCTAGAGGGCCCAAGCTTACGCGTGCATGCGACGTCATAGCTC
TCTCCCTATAGTGAGTCGTATTATAAGCTAGGCACTGGCCGTCGTTTTTACAACGTCGTGA
CTGGGAAAACCTGCTAGCTTGGGATCTTTGTGAAGGAACCTTACTTCTGTGGTGTGACATA
ATTGGACAAACTACCTACAGAGATTTAAAGCTCTAAGGTAAATATAAAATTTTTAAGTGT
ATAATGTGTTAAACTAGCTGCATATGCTTGCTGCTTGAGAGTTTTGCTTACTGAGTATGA
TTTATGAAAATATTATACACAGGAGCTAGTGATTCTAATTGTTTGTGTATTTTAGATTCA
CAGTCCCAAGGCTCATTTACAGGCCCTCAGTCCTCACAGTCTGTTTCATGATCATAATCAG
CCATACCACATTTGTAGAGGTTTTACTTGCTTTAAAAAACCTCCACACCTCCCCCTGAA
CCTGAAACATAAAATGAATGCAATTGTTGTTGTTAACTTGTTTATTGCAGCTTATAATGG
TTACAAATAAAGCAATAGCATCACAAATTTACAAATAAAGCATTTTTTTCACTGCATTC
TAGTTGTGGTTTGTCCAAACTCATCAATGTATCTTATCATGTCTGGATCGATCCTGCATT
AATGAATCGGCCAACGCGCGGGGAGAGGCGGTTTGGCGTATTGGCTGGCGTAATAGCGAAG
AGGCCCGCACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGGACGCGC
CCTGTAGCGGCGCATTAAGCGCGGGGTGTTGTTGTTACGCGCAGCGTGACCGCTACAC
TTGCCAGCGCCCTAGCGCCCGCTCCTTTTCGCTTTCTTCCCTTCTTCTCGCCACGTTCCG
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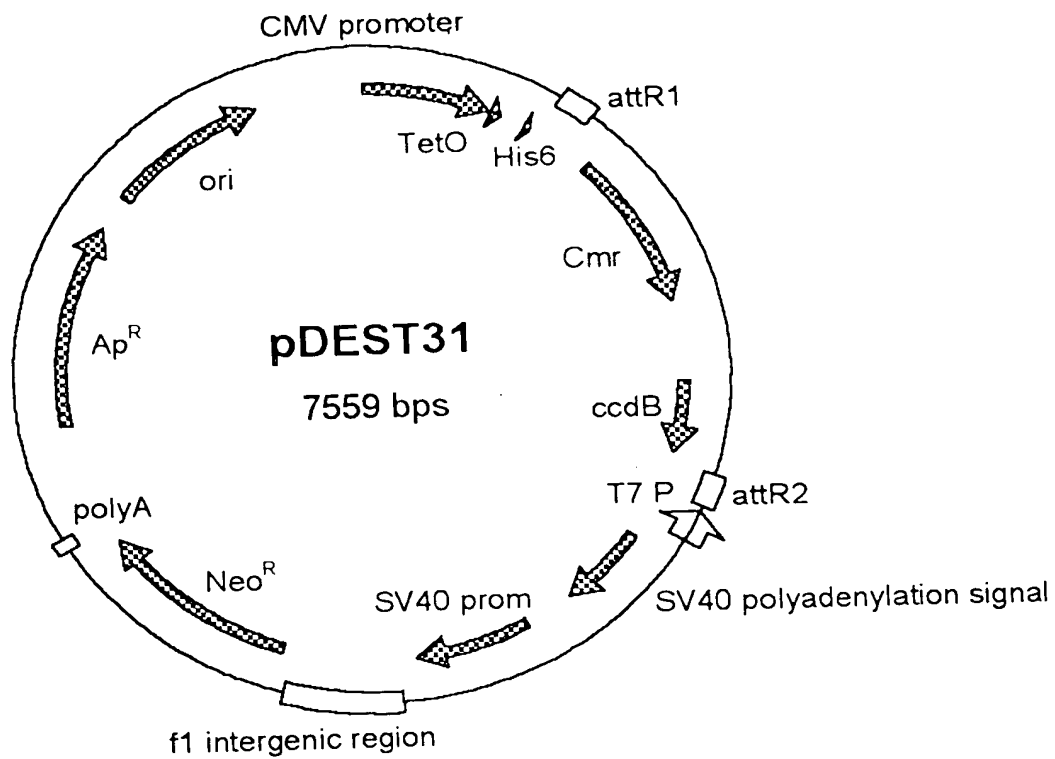


FIGURE 93A

ATGCATGTCGTTACATAACTTACGGTAAATGGCCCCGCTGGCTGACCGCCCAACGACCCC
CGCCCATTGACGTCAATAATGACGTATGTTCCCATAGTAACGCCAATAGGGACTTTCCAT
TGACGTCAATGGGTGGAGTATTTACGGTAAACTGCCCACTTGGCAGTACATCAAGTGTAT
CATATGCCAAGTACGCCCCCTATTGACGTCAATGACGGTAAATGGCCCCGCTGGCATTAT
GCCAGTACATGACCTTATGGGACTTTCCTACTTGGCAGTACATCTACGTATTAGTCATC
GCTATTACCATGGTGTATGCGGTTTTTGGCAGTACATCAATGGGCGTGGATAGCGGTTTTGAC
TCACGGGGATTTCCAAGTCTCCACCCCATTGACGTCAATGGGAGTTTTGTTTTGGCACCAA
AATCAACGGGACTTTCAAAAATGTCTGAACAACACTCCGCCCATTGACGCAAATGGGCGGT
AGGCGTGTACGGTGGGAGGTCTATATAAGCAGAGCTCTCCCTATCAGTGATAGAGATCTC
CCTATCAGTGATAGAGATCGTCGACGAGCTCGTTTAGTGAACCGTCAGATCGCCTGGAGA
CGCCATCCACGCTGTTTTGACCTCCATAGAAGACACCGGGACCGATCCAGCCTCCGGACC
ATGGCGTACTACCATCACCATCACACCGGTGATATCCTCGAGCCCATCACAAAGT
TTGTACAAAAAAGCTGAACGAGAAACGTAAAATGATATAAATATCAATATATTAAATTAG
ATTTTGCATAAAAAACAGACTACATAAATACTGTAAAACACAACATATCCAGTCACTATGG
CGGCCGCTATTAGGCACCCCGAGGCTTTTACACTTTATGCTTCCGGCTCGTATAATGTGTGA
TTTTGAGTTAGGATCCGGCGAGATTTTCAGGAGCTAAGGAAGCTAAAATGGAGAAAAAA
TCACTGGATATACACCGTTGATATATCCCAATGGCATCGTAAAGAACATTTTGGAGCAT
TTCAGTCAGTTGCTCAATGTACCTATAACCAGACCGTTTCAGCTGGATATTACGGCCTTTT
TAAAGACCGTAAAGAAAAATAAGCACAAGTTTTTATCCGGCCTTTATTACATTCTTGCCC
GCCTGATGAATGCTCATCCGGAATTCGGTATGGCAATGAAAGACGGTGAGCTGGTGATAT
GGGATAGTGTTTACCCTTGTTACACCGTTTTCCATGAGCAAACCTGAAACGTTTTTCATCGC
TCTGGAGTGAATACCACGACGATTTCCGGCAGTTTCTACACATATATTCGCAAGATGTGG
CGTGTTACGGTGAAAACCTGGCCTATTTCCCTAAAGGGTTTATTGAGAATATGTTTTTCG
TCTCAGCCAATCCCTGGGTGAGTTTACCAGTTTGTATTAAACGTGGCCAATATGGACA
ACTTCTTCGCCCCCGTTTTTACCATGGGCAAATATTATACGCAAGGCGACAAGGTGCTGA
TGCCGCTGGCGATTTCAGGTTTCATCATGCCGTCTGTGATGGCTTCCATGTGCGCAGAATGC
TTAATGAATTACAACAGTACTGCGATGAGTGGCAGGGCGGGCGTAAACGCGTGGATCCG
GCTTACTAAAAGCCAGATAACAGTATGCGTATTTGCGCGCTGATTTTTGCGGTATAAGAA
TATATACTGATATGTATACCCGAAGTATGTCAAAAAGAGGTGTGCTATGAAGCAGCGTAT
TACAGTGACAGTTGACAGCGACAGCTATCAGTTGCTCAAGGCATATATGATGTCAATATC
TCCGGTCTGGTAAGCACAACCATGCAGAATGAAGCCCGTCTGCTGCGTGCCGAACGCTGG
AAAGCGGAAAATCAGGAAGGGATGGTGAAATGCAGTTTAAAGTTTACACCTATAAAAGAGA
TTTGCTGACGAGAACAGGACTGGTGAAATGCAGTTTAAAGTTTACACCTATAAAAGAGA
GAGCCGTTATCGTCTGTTTGTGGATGTACAGAGTGATATTATTGACACGCCCCGGGCGACG
GATGGTGATCCCCCTGGCCAGTGCACGTCTGCTGTGATATAAAGTCTCCCGTGAACCTTA
CCCGGTGGTGATATCGGGGATGAAAGCTGGCGCATGATGACCACCGATATGGCCAGTGT
GCCGGTCTCCGTTATCGGGGAAGAAGTGGCTGATCTCAGCCACCGCGAAAATGACATCAA
AAACGCCATTAACTGATGTTCTGGGGAATATAAATGTCAGGCTCCGTTATACACAGCCA
GTCTGCAGGTGACCATAGTGAAGTGGATATGTTGTGTTTTTACAGTATTATGTAGTCTGTT
TTTTATGCAAAATCTAATTTAATATATTGATATTTATATCATTTTACGTTTCTCGTTTACG
CTTTCTTGTAAGTGGTGATGGGCGGCCGCTCTAGAGGGCCCAAGCTTACGCGTGCAT
GCGACGTATAGCTCTCTCCCTATAGTGAGTCTGATTTATAAGCTAGGCACTGGCCGTCGT
TTTACAACGTCTGACTGGGAAAACCTGCTAGCTTGGGATCTTTGTGAAGGAACCTTACTT
CTGTGGTGTGACATAAATTGGACAAACTACCTACAGAGATTTAAAGCTCTAAGGTAAATAT
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 GGCCTGAAATAACCTCTGAAAGAGGAACCTGGTTAGGTACCTTCTGAGGCGGAAAGAACC
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 GACTAATTTTTTTTTTATTTATGCAGAGGCCGAGGCCGCCTCGGCCTCTGAGCTATTTCCAGA
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 CTGGCTGCTATTGGGCGAAGTGCCGGGGCAGGATCTCCTGTCTCATCTCACCTTGCTCCTGC
 CGAGAAAGTATCCATCATGGCTGATGCAATGCGGCGGCTGCATACGCTTGATCCGGCTAC
 CTGCCCCATTTCGACCACCAAGCGAAACATCGCATCGAGCGAGCACGTAAGTCCGATGGAAGC
 CGGTCTTGTCGATCAGGATGATCTGAGACGAAGAGCATCAGGGGCTCGCGCCAGCCGAAC
 GTTCGCCAGGCTCAAGGCGCGCATGCCCGACGGCGAGGATCTCGTCGTGACCCATGGCGA
 TGCCTGCTTGCCGAATATCATGGTGGAATGGCCGCTTTTCTGGATTTCATCGACTGTGG
 CCGGCTGGGTGTGGCGGACCGCTATCAGGACATAGCGTTGGCTACCCGTGATATTGCTGA
 AGAGCTTGCGCGCGAATGGGCTGACCGCTTCCTCGTGCTTTACGGTATCGCCGCTCCCGA
 TTCGCAGCGCATCGCCTTCTATCGCCTTCTTGACGAGTTCTTCTGAGCGGGACTCTGGGG
 TTCGAAATGACCGACCAAGCGACGCCCCAACCTGCCATCACGATGGCCGCAATAAAATATC
 TTTATTTTTCATTACATCTGTGTGTTGGTTTTTTGTGTGAATCGATAGCGATAAGGATCCG
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 CCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGCTGCTCCCGCATCCGCTTACAG
 ACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTGTCAGAGGTTTTACACGTCATCACCGAA
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 TCAAGAGCTACCAACTCTTTTTCCGAAGGTAACCTGGCTTCAGCAGAGCGCAGATACCAAA
 TACTGTCCTTCTAGTGTAGCCGTAGTTAGGCCACCCTTCAAGAACCTGTAGACCCGCC
 TACATACCTCGCTCTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGGCGATAAGTCGTG
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FIGURE 93C

2017年12月20日

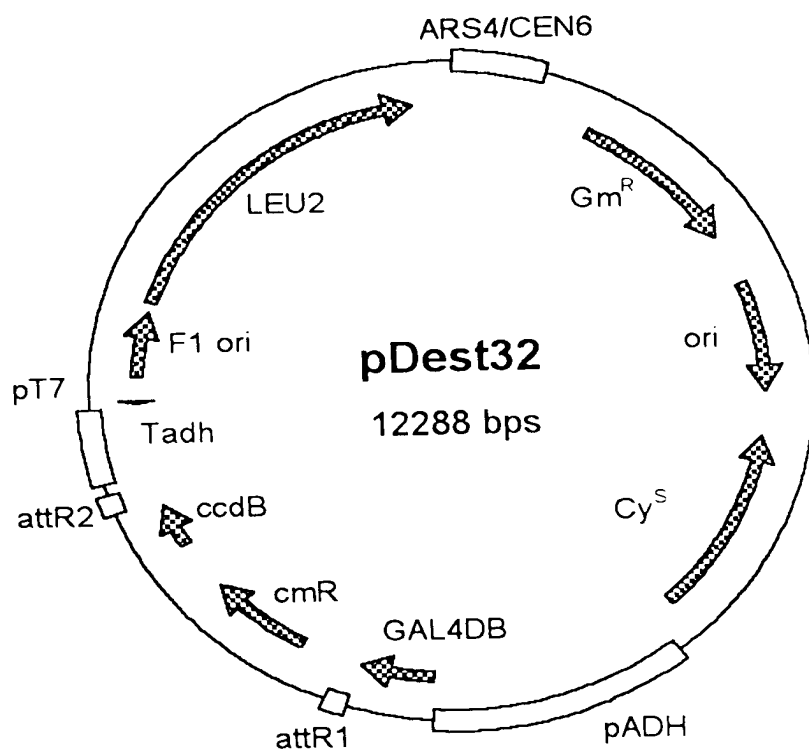


FIGURE 94A

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TCTACACAGACAAGATGAAACAATTCGGCATTAATACCTGAGAGCAGGAAGAGCAAGATA
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 GCTCAATAACTGGAGCAGTTTCTTAGAAGCAGATTTCAAGTATTGGTCTCTCTTGTCTTC
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 TTTGAACCTATCTGGAAAATAGCATTAACAAGCGAAAACTGCGAGGAAAATTGTTTGC
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Figure 94C

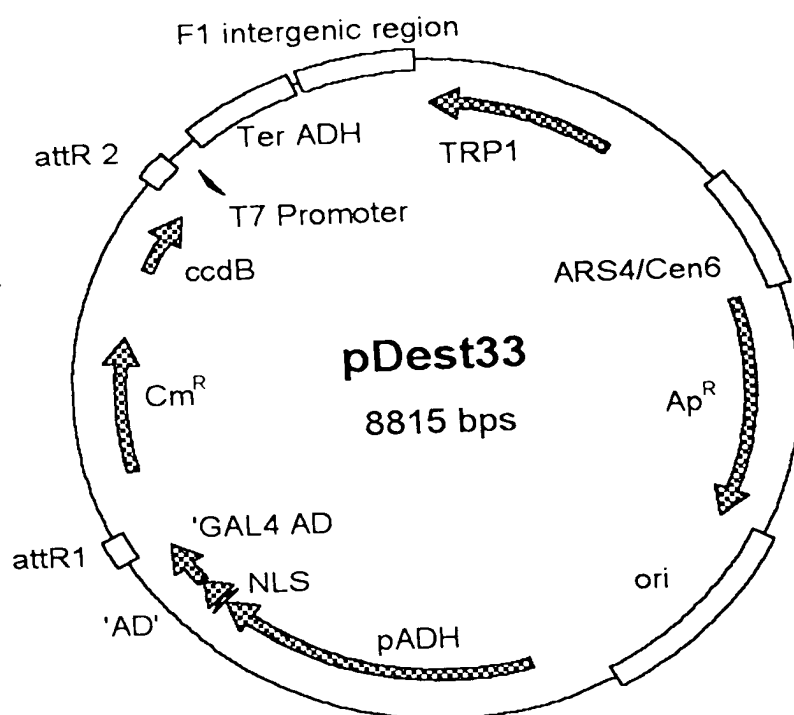


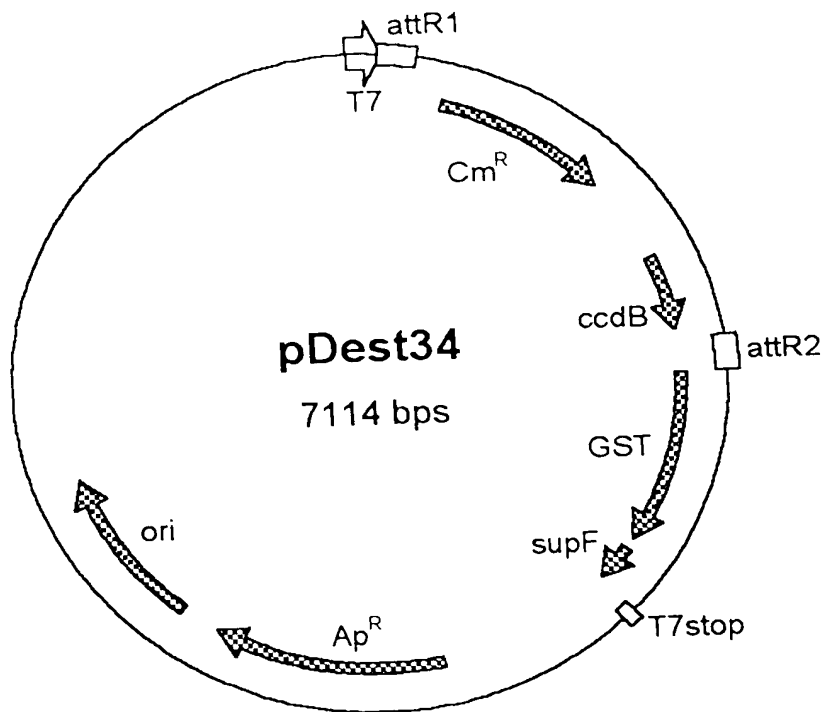
FIGURE 95A

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TCACCCAATTGTAGATATGCTAACTCCAGCAATGAGTTGATGAATCTCGGTGTGTATTTT
ATGTCCTCAGAGGACAATACCTGTTGTAATCGTTCTTCCACACGGATCCGCATCAGGCGA
AATTGTAAACGTTAATATTTTGTAAATTCGCGTTAAATATTTGTTAAATCAGCTCATT
TTTTAACCAATAGGCCGAAATCGGCCAAAATCCCTTATAAATCAAAAGAATAGACCGAGAT
AGGGTTGAGTGTTGTTCCAGTTTGGAAACAAGAGTCCACTATTAAAGAACGTGGACTCCAA
CGTCAAAGGGCGAAAAACCGTCTATCAGGGCGATGGCCCACTACGTGAACCATCACCTTA
ATCAAGTTTTTTTGGGGTTCGAGGTGCCGTAAAGCACTAAATCGGAACCCTAAAGGGAGCCC
CCGATTTAGAGCTTGACGGGGAAAGCCGGCGAACGTGGCGAGAAAGGAAGGAAGAAAGC
GAAAGGAGCGGGCGCTAGGGCGCTGGCAAGTGTAGCGGTACGCTGCGCGTAACCACCAC
ACCCGCCGCGCTTAATGCGCCGCTACAGGGCGCGTCCCATTCGCCATTCACTGCA

FIGURE 95D

FIGURE 96A



pDEST34 7114 bp

<u>Location (Base Nos.)</u>	<u>Gene Encoded</u>
195..71	attR1
304..963	CmR
1305..1610	ccdB
1651..1775	attR2
1780..2472	GST
2675..2720	T7stop
3334..4194	ampR
4343..4982	ori

ATCGAGATCTCGATCCCGCGAAATTAATACGACTCACTATAGGGAGACCACAACGGTTTC
CCTCTAGATCACAAGTTTGTACAAAAAGCTGAACGAGAAACGTAAAATGATATAAATAT
CAATATATTAAATTAGATTTTGCATAAAAAACAGACTACATAATACTGTAAAACACAACA
TATCCAGTCACTATGGCGGCCGCATTAGGCACCCCAGGCTTTACACTTTATGCTTCCGGC
TCGTATAATGTGTGGATTTTGTAGTTAGGATCCGGCGAGATTTTCAGGAGCTAAGGAAGCT
AAAATGGAGAAAAAATCACTGGATATACCACCGTTGATATATCCCAATGGCATCGTAAA
GAACATTTTGTAGGCATTTTCAGTCAGTTGCTCAATGTACCTATAACCAGACCGTTTCAGCTG
GATATTACGGCCTTTTAAAGACCGTAAAGAAAAATAAGCACAAGTTTTATCCGGCCTTT
ATTCACATTTGCCCCGCTGATGAATGCTCATCCGGAATTCGGTATGGCAATGAAAGAC
GGTGAGCTGGTGATATGGGATAGTGTTTACCCTTGTTACACCGTTTTCCATGAGCAAAT
GAAACGTTTTTCATCGCTCTGGAGTGAATACCACGACGATTTCCGGCAGTTTCTACACATA
TATTCGCAAGATGTGGCGTGTTACGGTGAAAACCTGGCCTATTTCCCTAAAGGGTTTAT
GAGAATATGTTTTTCGTCTCAGCCAATCCCTGGGTGAGTTTACCAGTTTTGATTTAAAC
GTGGCCAATATGGACAACCTTCTCGCCCCCGTTTTACCATGGGCAAATATTATACGCAA
GGCGACAAGGTGCTGATGCCGCTGGCGATTTCAGGTTTCATCATGCCGCTGTGTATGGCTTC
CATGTCGGCAGAATGCTTAATGAATTACAACAGTACTGCGATGAGTGGCAGGGCGGGGCG
TAAACGCGTGGATCCGGCTTACTAAAAGCCAGTATAACAGTATGCGTATTTGCGCGCTGAT
TTTTGCGGTATAAGAATATATACTGATATGTATACCCGAAGTATGTCAAAAAGAGGTGTG
CTATGAAGCAGCGTATTACAGTGACAGTTGACAGCGACAGCTATCAGTTGCTCAAGGCAT
ATATGATGTCAATATCTCCGGTCTGGTAAGCACAACCATGCAGAATGAAGCCCGTCGTCT
GCGTGCCGAACGCTGGAAAAGCGGAAATCAGGAAGGGATGGCTGAGGTGCGCCGGTTTAT
TGAAATGAACGGCTCTTTTGTGCTGACGAGAACAGGGACTGGTGAAATGCAGTTTAAAGGTT
ACACCTATAAAAAGAGAGAGCCGTTATCGTCTGTTTGTGGATGTACAGAGTGATATTATTG
ACACGCCCCGGGCGACGGATGGTGATCCCCCTGGCCAGTGCACGCTCTGCTGTCAGATAAG
TCTCCCGTGAACTTTACCCGGTGGTGCATATCGGGGATGAAAGCTGGCGCATGATGACCA
CCGATATGGCCAGTGTGCCGGTCTCCGTTATCGGGGAAGAAGTGGCTGATCTCAGCCACC
GCGAAAATGACATCAAAAACGCCATTAACCTGATGTTCTGGGGAATATAAATGTCAGGCT
CCCTTATACACAGCCAGTCTGCAGGTCGACCATAGTGACTGGATATGTTGTGTTTTACAG
TATTATGTAGTCTGTTTTTTATGCAAAATCTAATTTAATATATTGATATTTATATCATTT
TACGTTTCTCGTTCAGCTTTCTTGTAACAAGTGGTGATTATGTCCCCTATACTAGGTTAT
TGGAAAATTAAGGGCCTTGTGCAACCCACTCGACTTCTTTTGAATATCTTGAAGAAAAA
TATGAAGAGCATTGTATGAGCGCGATGAAGGTGATAAATGGCGAAACAAAAAGTTTGAA
TTGGGTTTGGAGTTTCCCAATCTTCTTATTATATTGATGGTGATGTTAAATTAACACAG
TCTATGGCCATCATACGTTATATAGCTGACAAGCACAACATGTTGGGTGGTTGTCCAAAA
GAGCGTGACAGAGATTTCAATGCTTGAAGGAGCGGTTTTGGATATTAGATACGGTGTTTCG
AGAATTGCATATAGTAAAGACTTTGAACTCTCAAAGTTGATTTTCTTAGCAAGCTACCT
GAAATGCTGAAAATGTTTGAAGATCGTTTATGTCATAAAACATATTTAAATGGTGATCAT
GTAACCCATCCTGACTTCATGTTGTATGACGCTCTTGATGTTGTTTTATACATGGACCCA
ATGTGCCCTGGATGCGTTCCCAAAATTAGTTTGTTTTTTAAAAAACGTATTGAAGCTATCCCA
CAAATTGATAAGTACTTGAAATCCAGCAAGTATATAGCATGGCCTTTGCAGGGCTGGCAA
GCCACGTTTGGTGGTGGCGACCATCTCCAAAATCGGATCTGGTTCCGCGTCCATGGGGA
TCCGGCTGCTAACAAAGCCCCGAAGGCTGAGTTGGCTGCTGCCACCGCTGAGCGCTT
CCCGATAAGGGAGCAGGCCAGTAAAAGCATTACCCGTGGTGGGGTTCCCGAGCGGCCAAA
GGGAGCAGACTCTAAATCTGCCGTCATCGACTTCGAAGGTTTGAATCCTTCCCCACCAC
CATCACTTTCAAAAGTGAATTTCGCTGAGCAATAACTAGCATAACCCCTTGGGGCCTCTAA-

FIGURE 96B

ACGGGTCTTGAGGGGTTTTTTTGCTGAAAGGAGGAAGTATATCCGGATATCCACAGGACGG
 GTGTGGTCGCCATGATCGCGTAGTCGATAGTGGCTCCAAGTAGCGAAGCGAGCAGGACTG
 GGCGGCGGCCAAAGCGGTCCGGACAGTGCTCCGAGAACGGGTGCGCATAGAAATTGCATCA
 ACGCATATAGCGCTAGCAGCACGCCATAGTGAAGTGGCGATGCTGTGCGAATGGACGATAT
 CCCGCAAGAGGGCCCGGCAGTACCGGCATAACCAAGCCTATGCCTACAGCATCCAGGGTGA
 CGGTGCCGAGGATGACGATGAGCGCATTGTTAGATTTTCATACACGGTGCCTGACTGCGTT
 AGCAATTTAACTGTGATAAACTACCGCATTAAAGCTTATCGATGATAAGCTGTCAAACAT
 GAGAATTCTTGAAGACGAAAGGGCCTCGTGATACGCCTATTTTTTATAGGTTAATGTCATG
 ATAATAATGGTTTTCTTAGACGTGAGTGGCAGTTTTCGGGGAAATGTGCGCGGAACCCCT
 TAAATGCTTCAATAATATTGAAAAAGGAAGAGTATGAGTATTCAACATTTCCGTGTGCC
 CTTATTCCCTTTTTTTCGGGCATTTTGCCTTCCTGTTTTTGTCTACCCAGAAACGCTGGTG
 AAAGTAAAAGATGCTGAAGATCAGTTGGGTGCACGAGTGGGTACATCGAACTGGATCTC
 AACAGCGGTAAGATCCTTGAGAGTTTTCGCCCCGAAGAACGTTTTCCAATGATGAGCACT
 TTTAAAGTTCTGCTATGTGGCGCGGTATTATCCCGTGTGACGCCGGGCAAGAGCAACTC
 GGTCGCCGCATACACTATTCTCAGAATGACTTGGTTGAGTACTCACCAGTCACAGAAAAG
 CATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGTGCTGCCATAACCATGAGTGAT
 AACACTGCGGCCAACTTACTTCTGACAACGATCGGAGGACCGAAGGAGCTAACCGCTTTT
 TTGCACAACATGGGGGATCATGTAACCTGCCTTGATCGTTGGGAACCGGAGCTGAATGAA
 GCCATACCAAACGACGAGCGTGACACCACGATGCCTGAGCAATGGCAACAACGTTGCGC
 AAATATTAAGTGGCGAACTACTTACTCTAGCTTCCCGGCAACAATTAATAGACTGGATG
 GAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTGGTTTTATT
 GCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACTGGGGCCA
 GATGGTAAGCCCTCCCGTATCGTAGTTATCTACACGACGGGGAGTCAGGCAACTATGGAT
 GAACGAAATAGACAGATCGCTGAGATAGGTGCCTCACTGATTAAAGCATTGGTAAGTGTCA
 GACCAAGTTTACTCATATATACTTTAGATTGATTTAAAACCTTCATTTTTTAATTTAAAGG
 ATCTAGGTGAAGATCCTTTTTTGATAATCTCATGACCAAAATCCCTTAACGTGAGTTTTCG
 TTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTTTT
 CTGCGCGTAATCTGCTGCTTGCAAAACAAAAAACACCGCTACCAGCGGTGGTTGGTTG
 CCGGATCAAGAGCTACCAACTCTTTTTCCGAAGGTAACCTGGCTTCAGCAGAGCGCAGATA
 CCAAATACTGTCTTCTAGTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCTGTAGCA
 CCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAAGTGGCTGCTGCCAGTGGCGATAAG
 TCGTGTCTTACCGGGTTGGACTCAAGACGATGTTTACCGGATAAAGGCGCAGCGGTGCGGC
 TGAACGGGGGGTTTCGTGCACACAGCCAGCTTGGAGCGAACGACCTACACCGAACTGAGA
 TACCTACAGCGTGAAGCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACAGG
 TATCCCGGTAAGCGGCAGGGTCCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGGGGAAAC
 GCCTGGTATCTTTATAGTCCTGTGCGGTTTTCGCCACCTCTGACTTGAGCGTCGATTTTTG
 TGATGCTCGTCAGGGGGGCGGAGCCTATGGAAAACGCCAGCAACGCGGCCTTTTTACGG
 TTCCTGGCCTTTTTGCTGGCCTTTTTGCTCACATGTTCTTTCTGCGTTATCCCCTGATTCT
 GTGGATAACCGTATTACCGCCTTTGAGTGAGCTGATACCGCTCGCCGAGCCGAACGACC
 GAGCGCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGCCTGATGCGGTATTTCTCCTT
 ACGCATCTGTGCGGTATTTACACCGCATATATGGTGCACTCTCAGTACAATCTGCTCTG
 ATGCCGCATAGTTAAGCCAGTATACACTCCGCTATCGCTACGTGACTGGGTGATGGCTGC
 GCCCCGACACCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCATC
 CGCTTACAGACAAGCTGTGACCGTCTCCGGAGCTGCATGTGTGAGAGGTTTTACCGTC
 ATCACCGAAACGCGCGAGGCGAGCTGCGGTAAAGCTCATCAGCGTGGTGTGAAGCGATTCT
 ACAGATGTCTGCCTGTTTCATCCGCGTCCAGCTCGTTGAGTTTCTCCAGAAGCGTTAATGT
 CTGGCTTCTGATAAAGCGGGCCATGTTAAGGGCGGTTTTTTCTGTTTTGGTCACTGATGC
 CTCCGTGTAAGGGGGATTTCTGTTTCATGGGGGTAATGATACCGATGAAACGAGAGAGGAT
 GCTCACGATACGGGTTACTGATGATGAACATGCCCGGTTACTGGAACGTTGTGAGGGTAA
 ACAACTGGCGGTATGGATGCGGCGGGACCAGAGAAAAATCACTCAGGGTCAATGCCAGCG
 CTTCGTTAATACAGATGTAGGTGTTCCACAGGGTAGCCAGCAGCATCCTGCGATGCAGAT
 CCGGAACATAATGGTGCAGGGCGCTGACTTCCGCGTTTCCAGACTTTACGAAACACGGAA
 ACCGAAGACCATTATGTTGTTGCTCAGGTGCGCAGACGTTTTGACGAGCAGCATCGCTTCA
 CGTTGCTCGCGTATCGGTGATTCTGCTAACCAGTAAGGCAACCCCGCCAGCCTAG
 CCGGGTCTCAACGACAGGAGCAGATCATGCGCACCCGTTGGCCAGGACCAACGCTGCC
 CGAGATGCGCCGCGTGCGGCTGCTGGAGATGGCGGACGCGATGGATATGTTCTGCCAAGG
 GTTGGTTTTGCGCATTCACAGTTCTCCGCAAGAATTGATTGGCTCCAATTCTTGGAGTGGT-

FIGURE 96C

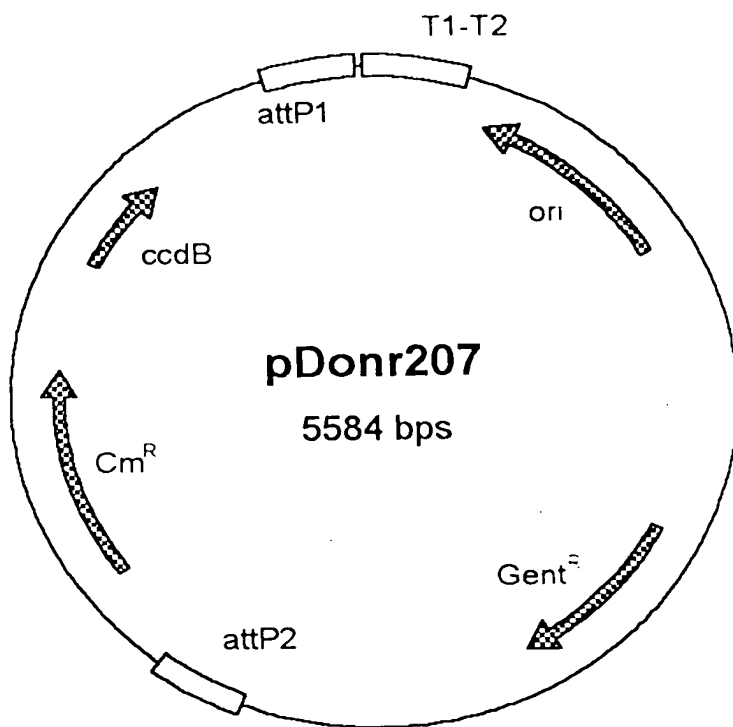


FIGURE 97A

GCGAGAGTAGGGAACTGCCAGGCATCAAATAAAACGAAAGGCTCAGTCGGAAGACTGGGC
CTTTCGTTTTATCTGTTGTTTGTTCGGTGAACGCTCTCCTGAGTAGGACAAATCCGCCGGG
AGCGGATTTGAACGTTGTGAAGCAACGGCCCCGAGGGTGGCGGGCAGGACGCCCGCCATA
AACTGCCAGGCATCAAATAAGCAGAAGGCCATCCTGACGGATGGCCTTTTTGCGTTTCT
ACAAACTCTTCTGGCTAGCGGTAATACGGTTATCCACAGAATCAGGGGATAACGCAGGA
AAGAACATGTGAGCAAAAGGCCAGCAAAAGGCCAGGAACCGTAAAAAGGCCGCTTGCTG
GCGTTTTTCCATAGGCTCCGCCCCCTGACGAGCATCACAAAAATCGACGCTCAAGTCAG
AGGTGGCGAAACCCGACAGGACTATAAAGATACCAGGCGTTTCCCCCTGGAAGCTCCCTC
GTGCGCTCTCCTGTTCCGACCCTGCCGCTTACCGGATACCTGTCCGCCTTTCTCCCTTCG
GGAAGCGTGGCGCTTTCTCATAGCTCACGCTGTAGGTATCTCAGTTCGGTGTAGGTGCTT
CGCTCCAAGCTGGGCTGTGTGCACGAACCCCCCGTTCAGCCCCGACCGCTGCGCCTTATCC
GGTAACTATCGTCTTGAGTCCAACCCGGTAAGACACGACTTATCGCCACTGGCAGCAGCC
ACTGGTAACAGGATTAGCAGAGCGAGGTATGTAGGCGGTGCTACAGAGTTCTTGAAGCCA
TGGCCTAACTACGGCTACACTAGAAGGACAGTATTTGGTATCTGCGCTCTGCTGAAGCCA
GTTACCTTCGGAAAAAGAGTTGGTAGCTCTTGATCCGGCAAACAAACCACCGCTGGTAGC
GGTGGTTTTTTTTGTTTGCAAGCAGCAGATTACGCGCAGAAAAAAGGATCTCAAGAAGAT
CCTTTGATCTTTTCTACGGGGTCTGACGCTCAGTGGAACGAAAACTCACGTTAAGGGATT
TTGGTCATGAGCTTGCGCCGTCCCGTCAAGTCAGCGTAATGCTCTGCCAGTGTTACAACC
AATTAACCAATTCTGATTAGAAAAAATCATCGAGCATCAAATGAACTGCAATTTATTCA
TATCAGGATTATCAATACCATTTTTTGAAAAAGCCGTTTCTGTAATGAAGGAGAAAACT
CACCGAGGCAGTTCCATAGGATGGCAAGATCCTGGTATCGGTCTGCGATTCCGACTCGTC
CAACATCAATACAACCTATTAGTAGCCAACCACTAGAACTATAGCTAGAGTCTGGGCGA
ACAAACGATGCTCGCCTTCCAGAAAACCGAGGATGCGAACCCTTCATCCGGGGTCAGCA
CCACCGGCAAGCGCCGCGACGGCCGAGGTCTTCCGATCTCCTGAAGCCAGGGCAGATCCG
TGCACAGCACCTTGCCGTAGAAGAACAGCAAGGCCGCCAATGCCTGACGATGCGTGGAGA
CCGAAACCTTGCGCTCGTTCGCCAGCCAGGACAGAAATGCCTCGACTTCGCTGCCCA
AGGTTGCCGGGTGACGCACACCGTGGAACCGGATGAAGGCACGAACCCAGTTGACATAAG
CCTGTTTCGGTTCGTAACTGTAATGCAAGTAGCGTATGCGCTCACGCAACTGGTCCAGAA
CCTTGACCGAACCGCAGCGGTGGTAACGGCGCAGTGGCGGTTTTTCATGGCTTGTTATGACT
GTTTTTTTTGTACAGTCTATGCCTCGGGCATCCAAGCAGCAAGCGCGTTACGCCGTGGGT
GATGTTTGATGTTATGGAGCAGCAACGATGTTACGCAGCAGCAACGATGTTACGCAGCAG
GGCAGTCGCCCTAAAACAAAGTTAGGTGGCTCAAGTATGGGCATCATTTCGCACATGTAGG
CTCGGCCCTGACCAAGTCAAATCCATGCGGGCTGCTCTTGATCTTTTCGGTCTGAGTTC
GGAGACGTGACCACCTACTCCCAACATCAGCCGGACTCCGATTACCTCGGGAACCTTGCTC
CGTAGTAAGACATTTCATCGCGCTTGCTGCCTTCGACCAAGAAGCGGTTGTTGGCGCTCTC
GCGGCTTACGTTCTGCCCAGGTTTGAGCAGCCGCGTAGTGAGATCTATATCTATGATCTC
GCAGTCTCCGGCGAGCACCCGAGGCAGGGCATTGCCACCGCGCTCATCAATCTCCTCAAG
CATGAGGCCAACGCGCTTGGTGCTTATGTGATCTACGTGCAAGCAGATTACGGTGACGAT
CCCGCAGTGGCTCTCTATACAAAGTTGGGCATACGGGAAGAAGTGATGCACTTTGATATC
GACCCAAGTACCGCCACCTAACCAATTTCGTTCAAGCCGAGATCGGCTTCCCGGCCTAATTT
CCCCCTCGTCAAAAAATAAGGTTATCAAGTGAGAAATCACCATGAGTGACGACTGAATCCGG
TGAGAATGGCAAAAGTTTATGCATTTCTTTCCAGACTTGTTCAACAGGCCAGCCATTACG
CTCGTCATCAAAATCACTCGCATCAACCAACCGTTATTTCATTTCGTGATTGCGCCTGAGC
GAGACGAAATACGCGATCGCTGTTAAAAGGACAATTACAAACAGGAATCGAATGCAACCG
GCGCAGGAACACTGCCAGCGCATCAACAATATTTTCACCTGAATCAGGATATTCTTCTAA
TACCTGGAATGCTGTTTTTCCGGGGATCGCAGTGGTGAGTAACCATGCATCATCAGGAGT
ACGGATAAAATGCTTGATGGTCGGAAGAGGCATAAATCCGTCAGCCAGTTTAGTCTGAC
CATCTCATCTGTAACATCATTGGCAACGCTACCTTTGCCATGTTTCAGAAACAACTCTGG
CGCATCGGGCTTCCCATAACAAGCGATAGATTGTGCGACCTGATTGCCCCGACATTATCGCG
AGCCCATTTATACCCATATAAATCAGCATCCATGTTGGAATTTAATCGCGGCCTCGACGT
TTCCCGTTGAATATGGCTCATAACACCCCTGTATTACTGTTTATGTAAGCAGACAGTTT
TATTGTTTCATGATGATATATTTTTATCTTGTGCAATGTAACATCAGAGATTTTGAGACAC
GGGCCAGAGCTGCAGCTGGATGGCAATAATGATTTTATTTTACTGATAGTGACCTGTT
CGTTGCAACAAATTGATAAGCAATGCTTCTTATAATGCCAACTTTGTACAAGAAAGCTG
AACGAGAAACGTAAAATGATATAAATCAATATATTAATTAGATTTTGCATAAAAAAC
AGACTACATAATACTGTAAAACACAACATATCCAGTCACTATGAATCAACTACTTAGATG-

FIGURE 97B

GTATTAGTGACCTGTAGTCGACTAAGTTGGCAGCATCACCCGACGCACTTTGCGCCGAAT
AAATACCTGTGACGGAAGATCACTTCGCAGAATAAAATAAATCCTGGTGTCCCTGTTGATA
CCGGGAAGCCCTGGGCCAACTTTGGCGAAAATGAGACGTTGATCGGCACGTAAGAGGTTT
CAACTTTACCATAATGAAATAAGATCACTACCGGGCGTATTTTTTGTAGTTATCGAGATT
TTCAGGAGCTAAGGAAGCTAAAATGGAGAAAAAATCACTGGATATACCACCGTTGATAT
ATCCCAATGGCATCGTAAAGAACATTTTGGGGCATTTTCAGTCAGTTGCTCAATGTACCTA
TAACCAGACCGTTTTCAGCTGGATATTACGGCCTTTTAAAGACCGTAAAGAAAAATAAGCA
CAAGTTTTATCCGGCCTTTATTACATTCTTGCCCGCCTGATGAATGCTCATCCGGAATT
CCGTATGGCAATGAAAGACGGTGAGCTGGTGATATGGGATAGTGTTACCCTTGTTACAC
CGTTTTCCATGAGCAAACGTTTTCATCGCTCTGGAGTGAATACCACGACGATTT
CCGGCAGTTTTCTACACATATATTGCAAGATGTGGCGTGTTACGGTGAAAACCTGGCCTA
TTCCCTAAAGGGTTTTATTGAGAATATGTTTTTCGTCTCAGCCAATCCCTGGGTGAGTTT
CACCAGTTTTGATTTAAACGTGGCCAATATGGACAACTTCTTCGCCCCCGTTTTTACCAT
GGGCAAATATTATACGCAAGGCGACAAGGTGCTGATGCCGCTGGCGATTACAGTTTACGCA
TGCGGTCTGTGATGGCTTCCATGTGCGCAGAATGCTTAATGAATTACAACAGTACTGCGA
TGAGTGGCAGGGCGGGGCGTAATCGCGTGGATCCGGCTTACTAAAAGCCAGATAACAGTA
TGCGTATTTGCGCGCTGATTTTTTGGCGGTATAAGAATATATACTGATATGTATACCCGAAG
TATGTCAAAAAGAGGTGTGCTATGAAGCAGCGTATTACAGTGACAGTTGACAGCGACAGC
TATCAGTTGCTCAAGGCATATATGATGTCAATATCTCCGGTCTGGTAAGCACAACCATGC
AGAATGAAGCCCGTCTGCGTGCCGAACGCTGGAAAGCGGAAAATCAGGAAGGGATGG
CTGAGGTGCCCCGGTTTTATTGAAATGAACGGCTCTTTTGTGCTGACGAGAACAGGGACTGGT
GAAATGCAGTTTTAAGGTTTACACCTATAAAAGAGAGAGCCGTTATCGTCTGTTTGTGGAT
GTACAGAGTGATATTATTGACACGCCCCGGGCGACGGATGGTGATCCCCCTGGCCAGTGCA
CGTCTGCTGTGAGATAAAGTCTCCCGTGAACCTTACCCGGTGGTGATATCGGGGATGAA
AGCTGGCGCATGATGACCACCGATATGGCCAGTGTGCCGGTCTCCGTTATCGGGGAAGAA
GTGGCTGATCTCAGCCACCGCGAAAATGACATCAAAAACGCCATTAACCTGATGTTCTGG
GGAATATAAATGTCAGGCTCCCTTATACACAGCCAGTCTGCAGGTCGATACAGTAGAAAT
TACAGAACTTTATCACGTTTAGTAAGTATAGAGGCTGAAAATCCAGATGAAGCCGAACG
ACTTGTAAGAGAAAAGTATAAGAGTTGTGAAATTGTTCTTGATGCAGATGATTTTTCAGGA
CTATGACACTAGCGTATATGAATAGGTAGATGTTTTTATTTTGTACACAAAAAAGAGGC
TCGCACCTCTTTTTCTTATTTCTTTTATGATTTAATACGGCATTGAGGACAATAGCGAG
TAGGCTGGATACGACGATTCCGTTTGAGAAGAACATTTGGAAGGCTGTCCGTCGACTAAG
TTGGCAGCATCACCCGAAGAACATTTGGAAGGCTGTCCGTCGACTACAGGTCATAATAC
CATCTAAGTAGTTGATTCATAGTGACTGGATATGTTGTGTTTTACAGTATTATGTAGTCT
GTTTTTTATGCAAAATCTAATTTAATATATTGATATTTATATCATTTTACGTTTCTCGTT
CAGCTTTTTTGTACAAAGTTGGCATTATAAAAAAGCATTGCTCATCAATTTGTTGCAACG
AACAGGTCATCATCAGTCAAAATAAAATCATTATTTGGGGCCCCGAGATCCATGCTAGCGT
TAAC

FIGURE 97C

pMAB85

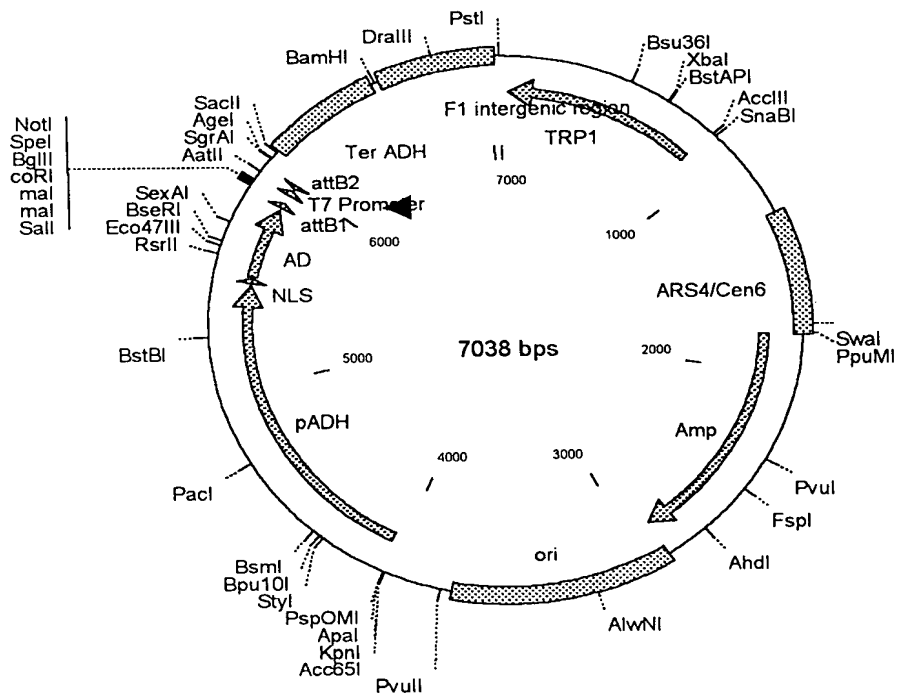


FIGURE 98A

GCCTTACGCATCTGTGCGGTATTTTCACACCGCAGGCAAGTGCACAAACAATACTTAAATA
AATACTACTCAGTAATAACCTATTTCTTAGCATTTTTTGACGAAATTTGCTATTTTTGTTAG
AGTCTTTTACACCATTTGTCTCCACACCTCCGCTTACATCAACACCAATAACGCCATTTA
ATCTAAGCGCATCACCAACATTTTCTGGCGTCAGTCCACCAGCTAACATAAAATGTAAGC
TTTCGGGGCTCTCTTGCCTTCCAACCCAGTCAGAAATCGAGTTCCAATCCAAAAGTTTAC
CTGTCCCACCTGCTTCTGAATCAAACAAGGGAATAAACGAATGAGGTTTCTGTGAAGCTG
CACTGAGTAGTATGTTGCAGTCTTTTGGAAATACGAGTCTTTTAATAACTGGCAAACCGA
GGAACCTCTTGGTATTCTTGGCCACGACTCATCTCCATGCAGTTGGACGATATCAATGCCGT
AATCATTGACCAGAGCCAAAACATCCTCCTTAGGTTGATTACGAAACACGCCAACCAAGT
ATTTTCGGAGTGCCTGAACTATTTTTATATGCTTTTACAAGACTTGAAATTTTCTTGCAA
TAACCGGGTCAATTGTTCTCTTTCTATTGGGCACACATATAATACCCAGCAAGTCAGCAT
CGGAATCTAGAGCACATTCTGCGGCCTCTGTGCTCTGCAAGCCGCAAACCTTTCACCAATG
GACCAGAACTACCTGTGAAATTAATAACAGACATACCTCAAGCTGCCTTTGTGTGCTTAA
TCACGTATACTCAGTGCTCAATAGTACCAATGCCCTCCCTCCTTGGCCCTCTCCTTTTC
TTTTTTTCGACCGAATTAATTCTTAATCGGCAAAAAAAGAAAAGCTCCGGATCAAGATTGT
ACGTAAGGTGACAAGCTATTTTTTCAATAAAGAATATCTTCCACTACTGCCATCTGGCGTC
ATAACTGCAAAGTACACATATATTACGATGCTGTCTATTAAATGCTTCTATATTATATA
TATAGTAATGTCGTTTATGGTGCACCTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAA
GCCAGCCCCGACACCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGG
CATCCGCTTACAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTGAGAGGTTTTTAC
CGTCATCACCGAAACGCGCGAGACGAAAGGGCCTCGTGATACGCCTATTTTTTATAGGTTA
ATGTCATGATAATAATGGTTTCTTAGGACGGATCGCTTGCCTGTAACCTTACACGCGCCTC
GTATCTTTTAATGATGGAATAATTTGGGAATTTACTCTGTGTTTATTTATTTTATGTTT
TGTATTTGGATTTTAGAAAGTAAATAAAGAAGGTAGAAGAGTTACGGAATGAAGAAAAA
AAATAAACAAAGGTTTAAAAAATTTCAACAAAAGCGTACTTTACATATATATTTATTAG
ACAAGAAAAGCAGATTAAATAGATATACATTCGATTAAAGTAAAGTAAATGTAAATCA
CAGGATTTTCGTGTGTGCTTCTTACACAGACAAGATGAAACAATTCGGCATTAATACCT
GAGAGCAGGAAGAGCAAGATAAAAGGTAGTATTTGTTGGCGATCCCCCTAGAGTCTTTTA
CATCTTCGGAAAACAAAACTATTTTTTCTTTAATTTCTTTTTTTACTTTCTATTTTTTA
TTTATATATTTATATTAAAAAATTTAAATTATAATTATTTTTTATAGCACGTGATGAAAAG
GACCCAGGTGGCACTTTTCGGGGAAATGTGCGCGGAACCCCTATTTGTTTATTTTTCTAA
ATACATTCAAATATGTATCCGCTCATGAGACAATAACCCTGATAAATGCTTCAATAATAT
TGAAAAGGAAGAGTATGAGTATTCAACATTTCCGTGTGCGCCCTTATTCCTTTTTTGCG
GCATTTTGCCTTCTGTGTTTTTGCTCACCCAGAAACGCTGGTGAAAGTAAAAGATGCTGAA
GATCAGTTGGGTGCACGAGTGGGTTACATCGAACTGGATCTCAACAGCGGTAAAGATCCTT
GAGAGTTTTCGCCCCGAAGAACGTTTTTCCAATGATGAGCACTTTTAAAGTCTGCTATGT
GGCGCGGTATTATCCCGTATTGACGCCGGGCAAGAGCAACTCGGTCGCCGATACACTAT
TCTCAGAATGACTTGGTTGAGTACTCACCAGTCACAGAAAAGCATCTTACGGATGGCATG
ACAGTAAGAGAATTATGCAGTGCTGCCATAACCATGAGTGATAACACTGCGGCCAACTTA
CTTCTGACAACGATCGGAGGACCGAAGGAGCTAACCGCTTTTTTTCACAACATGGGGGAT
CATGTAACTCGCCTTGATCGTTGGGAACCGGAGCTGAATGAAGCCATACCAAACGACGAG
CGTGACACCACGATGCCTGTAGCAATGGCAACAACGTTGCGCAAACCTATTAACCTGGCGAA
CTACTTACTCTAGCTTCCCGGCAACAATTAATAGACTGGATGGAGGCGGATAAAGTTGCA
GGACCACTTCTGCGCTCGGCCCTTCCGGCTGGCTGGTTTATTGCTGATAAATCTGGAGCC
GGTGAGCGTGGGTCTCGCGGTATCATTGCAGCACTGGGGCCAGATGGTAAGCCCTCCCGT
ATCGTAGTTATCTACACGACGGGCAGTCAGGCAACTATGGATGAACGAAATAGACAGATC
GCTGAGATAGGTGCCTCACTGATTAAGCATTGGTAACTGTCAGACCAAGTTTACTCATAT
ATACTTTAGATTGATTTAAACCTTCATTTTTTAATTTAAAGGATCTAGGTGAAGATCCTT
TTTGATAATCTCATGACCAAAATCCCTTAACGTGAGTTTTCGTTCCACTGAGCGTCAGAC
CCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTTTTCTGCGCGTAATCTGTCG
TTGCAAACAAAAAAACCACCGCTACCAGCGGTGGTTTGTGTTGCGCGATCAAGAGCTACCA
ACTTTTTTCCGAAGGTAACCTGGCTTCAGCAGAGCGCAGATACCAAATACTGTCCTTCTA
GTGTAGCCGTAGTTAGGCCACCACTTCAAGAACTCTGTAGCACCGCCTACATACCTCGCT
CTGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGGCGATAAGTCGTGTCTTACCGGGTTG
GACTCAAGACGATAGTTACCGGATAAGGCGCAGCGGTCCGGGCTGAACGGGGGGTTTCGTGC-

FIGURE 98B

ACACAGCCCAGCTTGGAGCGAACGACCTACACCGAACTGAGATACCTACAGCGTGAGCAT
TGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGCGGACAGGTATCCGGTAAGCGGCAGG
GTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGGGGAACGCCTGGTATCTTTATAGT
CCTGTCCGGTTCGCCACCTCTGACTTGAGCGTCGATTTTGTGATGCTCGTCAGGGGGG
CCGAGCCTATGGAAAAACGCCAGCAACGCGGCTTTTACGGTTCCTGGCCTTTTGCTGG
CCTTTTGCTCACATGTTCTTTCTGCGTTATCCCTGATTCTGTGGATAACCGTATTACC
GCCTTTGAGTGAGCTGATACCGCTCGCCGACGCCGAACGACCGAGCGCAGCGAGTCAGTG
AGCGAGGAAGCGGAAGAGCGCCCAATACGCAAACCGCCTCTCCCCGCGCGTTGGCCGATT
CATTAATGCAGCTGGCACGACAGGTTTCCCGACTGGAAAGCGGGCAGTGAGCGCAACGCA
ATTAATGTGAGTTACCTCACTCATTAGGCACCCAGGCTTTACACTTTATGCTTCCGGCT
CCTATGTTGTGTGGAATTGTGAGCGGATAACAATTTACACAGGAAACAGCTATGACCAT
GATTACGCCAAGCTCGGAATTAACCTCACTAAAGGGAACAAAAGCTGGGTACCGGGCCC
CCCCTCGAGATCCGGGATCGAAGAAATGATGGTAAATGAAATAGGAAATCAAGGAGCATG
AAGGCAAAAGACAAATATAAGGGTCTGAACGAAAAATAAAGTGAAAAGTGTTGATATGATG
TATTTGGCTTTGCGGCGCCGAAAAACAGGTTTACGCAATTGCACAATCATGCTGACTCT
GTGGCGGACCCGCGCTCTTGCCGGCCCCGGCGATAACGCTGGGCGTGAGGCTGTGCCCGG
GGAGTTTTTTGCGCCTGCATTTTCCAAGGTTTACCCTGCGCTAAGGGGCGAGATTGGAGA
AGCAATAAGAATGCCGTTGGGGTTCGATGATGACGACGACGACAACCTGGTGTCTATTAT
TTAAGTTGCCGAAAGAACCTGAGTGATGCAACATGAGTATACTAGAAGAATGAGCCA
AGACTTGCGAGACGCGAGTTTGCCGGTGGTGCGAACAATAGAGCGACCATGACCTTGAAG
GTGAGACGCGCATAACCGCTAGAGTACTTTGAAGAGGAAACAGCAATAGGGTTGCTACCA
GTATAAATAGACAGGTACATAACAACACTGGAAATGGTTGTCTGTTTGTGAGTACGCTTTCAA
TTCATTTGGGTGTGCACCTTTATTATGTTACAATATGGAAGGGAACCTTTACACTTCTCCTA
TGCACATATATTAATTAAGTCCAATGCTAGTAGAGAAGGGGGTAACACCCCTCCGCGC
TCTTTTCCGATTTTTTTTCTAAACCGTGGAATATTTCCGATATCCTTTTGTGTTTCCGGG
TGTACAATATGGACTTCCTCTTTTCTGGCAACCAAACCCATACATCGGGATTCTTATAAT
ACCTTCGTTGGTCTCCCTAACATGTAGGTGGCGGAGGGGAGATATACAATAGAACAGATA
CCAGACAAGACATAATGGGCTAAACAAGACTACACCAATTACACTGCCTCATTGATGGTG
GTACATAACGAACTAATACTGTAGCCCTAGACTTGATAGCCATCATCATATCGAAGTTTC
ACTACCCTTTTTCCATTTGCCATCTATTGAAGTAATAATAGGCGCATGCAACTCTTTTTC
TTTTTTTTTCTTTTCTCTCTCCCCGTTGTTGTCTCACCATATCCGCAATGACAAAAAAA
ATGATGGAAGACACTAAAGGAAAAAATTAACGACAAAGACAGCACCAACAGATGTCGTTG
TTCCAGAGCTGATGAGGGGTATCTTGAACACACGAAACTTTTTCTTCTCATTACAG
CACACTACTCTCTAATGAGCAACGGTATACGGCCTTCCTTCCAGTTACTTGAATTTGAAA
TAAAAAAAGTTTTGCCGCTTTGCTATCAAGTATAAATAGACCTGCAATTATTAATCTTTTG
TTTCTCGTCATTGTTCTCGTTCCCTTTCTTCTTGTCTTTTCTGACAAATATTTCA
AGCTATACCAAGCATAACAATCAACTCCAAGCTTATGCCCAAGAAGAAGCGGAAGGTCTCG
AGCGGCGCCAATTTTAATCAAAGTGGAATATTGCTGATAGCTCATTGTCCTTCACTTTC
ACTAACAGTAGCAACGGTCCGAACCTCATAACAACCTCAAACAAATTTCTCAAGCGCTTTC
CAACCAATTGCCTCCTCTAACGTTTCATGATAACTTCATGAATAATGAAATCACGGCTAGT
AAAATTGATGATGGTAATAATTCAAACCACTGTACCTGGTTGGACGGACCAAACCTGCG
TATAACGCGTTTGGAACTCACTACAGGGATGTTTAATACCACTACAATGGATGATGTATAT
AACTATCTATTGATGATGAAGATACCCACCAAACCCAAAAAAGAGGGTGGGTGATGAT
ACAAGTTTGTACAAAAAAGCAGGCTTGTGACACCCCGGGAATTCAGATCTACTAGTGCGGC
CGCACGCGTACCCAGCTTTCTTGTACAAAGTGTTGAGTACGTCGAGCTCCCTATAGTGAGTCG
TATTACACTGGCCGCTCGTTTTTACAACGTCGTGACTGGGAAAAACACCGGTGAGCTCTAAGT
AAGTAACGCGCCGACCGCGGTGGAGCTTTGGACTTCTTCGCCAGAGGTTTGGTCAAGTC
TCCAATCAAGGTTGTGCGCTTGTCTACCTTGCCAGAAATTTACGAAAAGATGGAAAAGGG
TCAAATCGTTGGTAGATACGTTGTTGACACTTCTAAATAAGCGAATTTCTTATGATTTAT
GATTTTTTATTATTAATAAGTTATAAAAAAATAAGTGATATAAAATTTTAAAGTGACTC
TTAGGTTTTTAAACGAAATTTCTTGTCTTGTAGTAACCTTTTCTGTAGGTGAGGTTGCT
TTCTCAGGTATAGCATGAGGTGCTCTTATTGACCACACCTCTACCGGCATGCCGAGCAA
ATGCCTGCAATCGCTCCCATTTTACCCAATTGTAGATATGCTAACTCCAGCAATGAGT
TGATGAATCTCGGTGTGTATTTTATGTCTCAGAGGACAATACCTGTTGTAATCGTTCTT
CCACACGGATCCGCATCAGGCGAAATTTGTAACGTTAATATTTTGTAAATTCGCGTTA
AATATTTGTTAAATCAGCTCATTTTTTAAACCAATAGGCCGAAATCGGCAAAATCCCTTAT
AAATCAAAAGAATAGACCGAGATAGGGTTGAGTGTTGTTCCAGTTTGGAAACAAGAGTCCA
CTATTAAAGAACGTGGACTCCAACGTCAAAGGGCGAAAAACCGTCTATCAGGGCGATGGC-

FIGURE 98C

CCACTACGTGAACCATCACCCCTAATCAAGTTTTTTGGGGTTCGAGGTGCCGTAAAGCACTA
AATCGGAACCCTAAAGGGAGCCCCGATTTAGAGCTTGACGGGGAAAGCCGGCGAACGTG
GCGAGAAAGGAAGGGAAGAAAGCGAAAGGAGCGGGCGCTAGGGCGCTGGCAAGTGTAGCG
GTCACGCTGCGCGTAACCACCACACCCGCCGCGCTTAATGCGCCGCTACAGGGCGCGTCC
CATTCGCCATTCACTGCA

FIGURE 98D

pMAB86

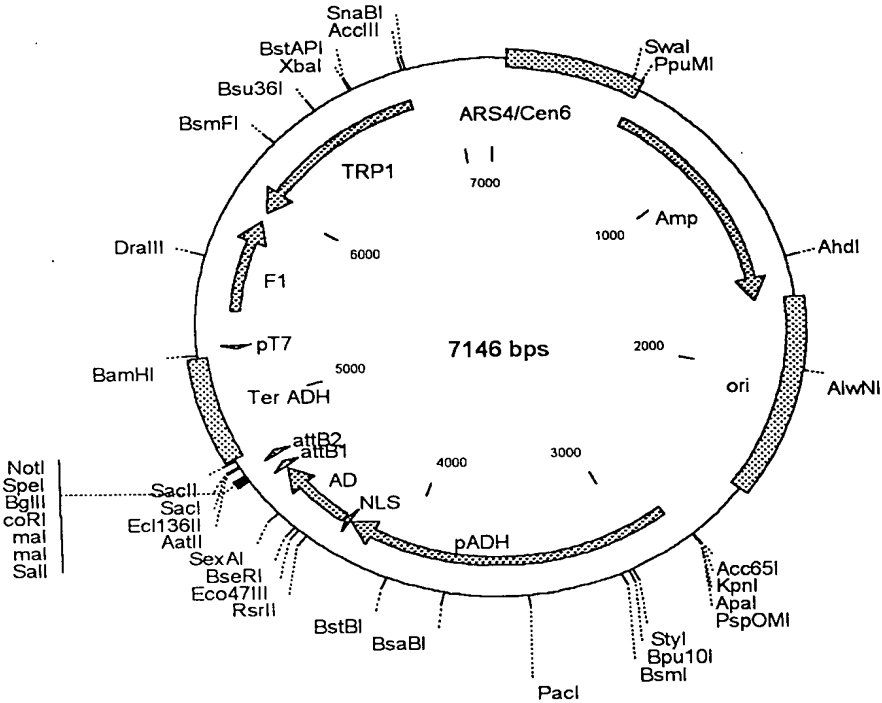


FIGURE 99A

GACGAAAGGGCCTCGTGATACGCCTATTTTTATAGGTTAATGTCATGATAATAATGGTTT
CTTAGGACGGATCGCTTGCTGTAACTTACACGCGCCTCGTATCTTTTAATGATGGAATA
ATTTGGGAATTTACTCTGTGTTTATTTATTTTTATGTTTTGTATTTGGATTTTAGAAAGT
AAATAAAGAAGGTAGAAGAGTTACGGAATGAAGAAAAAATAAACAAAGGTTTAAAAA
ATTTCAACAAAAAGCGTACTTTACATATATATTTATTAGACAAGAAAAGCAGATTAAATA
GATATACATTTCGATTAACGATAAGTAAAATGTAAAATCACAGGATTTTCGTGTGTGGTCT
TCTACACAGACAAGATGAAACAATTCGGCATTAAATACCTGAGAGCAGGAAGAGCAAGATA
AAAGGTAGTATTTGTTGGCGATCCCCCTAGAGTCTTTTACATCTTCGGAAAACAAAACT
ATTTTTTCTTTAATTTCTTTTTTTACTTTCTATTTTTTAATTTATATATTTATATTA
ATTTAAATTATAATTATTTTTTATAGCACGTGATGAAAAGGACCCAGGTGGCACTTTTCGG
GGAAATGTGCGCGGAACCCCTATTTGTTTATTTTTCTAAATACATTCAAATATGTATCCG
CTCATGAGACAATAACCCTGATAAATGCTTCAATAATATTGAAAAGGAAGAGTATGAGT
ATTCAACATTTCCGTGTGCGCCCTTATTCCCTTTTTTGCGGCATTTTGCCTTCCTGTTTT
GCTCACCCAGAAACGCTGGTGAAAGTAAAAGATGCTGAAGATCAGTTGGGTGCACGAGTG
GGTTACATCGAAGCTGGATCTCAACAGCGGTAAAGATCCTTGAGAGTTTTCGCCCCGAAGAA
CGTTTCCAATGATGAGCACTTTTAAAGTTCTGCTATGTGGCGCGGTATTATCCCGTATT
GACGCCGGGCAAGAGCAACTCGTTCGCCGCATACACTATTCTCAGAATGACTTGGTTGAG
TACTCACAGTCACAGAAAAGCATCTTACGGATGGCATGACAGTAAGAGAATTATGCAGT
GCTGCCATAACCATGAGTGATAACACTGCGGCCAACTTACTTCTGACAACGATCGGAGGA
CCGAAGGAGCTAACCGCTTTTTTTTACAACATGGGGGATCATGTAACTCGCCTTGATCGT
TGGGAACCGGAGCTGAATGAAGCCATACCAAACGACGAGCGTGACACCACGATGCCTGTA
GCAATGGCAACAACGTTGCGCAAACCTATTAAGTGGCGAACTACTTACTCTAGCTTCCCGG
CAACAATTAATAGACTGGATGGAGGCGGATAAAGTTGCAGGACCACTTCTGCGCTCGGCC
CTTCCGGCTGGCTGGTTTATTGCTGATAAATCTGGAGCCGGTGAGCGTGGGTCTCGCGGT
ATCATTGCAGCACTGGGGCCAGATGGTAAGCCCTCCCGTATCGTAGTTATCTACACGACG
GGCAGTCAGGCAACTATGGATGAACGAAATAGACAGATCGCTGAGATAGGTGCCTCACTG
ATTAAGCATTTGGTAACTGTGAGACCAAGTTTACTCATATATACTTTAGATTGATTTAAAA
CTTCATTTTTTAATTTAAAAGGATCTAGGTGAAGATCCTTTTTTGATAATCTCATGACCAA
ATCCCTTAAAGTGAGTTTTTCTGCTCCACTGAGCGTCAGACCCCGTAGAAAAGATCAAAGGA
TCTTCTTGAGATCCTTTTTTCTGCGCGTAATCTGCTGCTTGCAAACAAAAAACCACCG
CTACCAGCGGTGGTTTGTGTTGCGCGATCAAGAGCTACCAACTCTTTTTCCGAAGGTA
GGCTTCAGCAGAGCGCAGATACCAAATACTGTCTTCTAGTGTAGCCGTAGTTAGGCCAC
CACTTCAAGAACTCTGTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTG
GCTGCTGCCAGTGGCGATAAGTCGTGTCTTACCGGGTTGGACTCAAGACGATAGTTACCG
GATAAGGCGCAGCGGTGCGGCTGAACGGGGGGTTCGTGCACACAGCCCAGCTTGGAGCGA
ACGACCTACACCGAACTGAGATACCTACAGCGTGAGCATTGAGAAAGCGCCACGCTTCCC
GAAGGGAGAAAGGCGGACAGGTATCCGGTAAGCGGCAGGGTTCGGAACAGGAGAGCGCACG
AGGGAGCTTCCAGGGGGGAACGCCTGGTATCTTTATAGTCCTGTGCGGTTTCGCCACCTC
TGACTTGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGGCGAGCCTATGAAAAACGCC
AGCAACGCGGCCTTTTTACGGTTCCCTGGCCTTTTGCTGGCCTTTTGCTCACATGTTCTTT
CCTGCGTTATCCCCTGATTCTGTGGATAACCGTATTACCGCCTTTTGAGTGAGCTGATACC
GCTCGCCGACGACCGAACGACCGAGCGCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGCGC
CCAATACGCAAAACCGCCTCTCCCCGCGGTTGGCCGATTATTAATGCAGCTGGCACGAC
AGGTTTTCCGACTGGAAAGCGGGCAGTGAGCGCAACGCAATTAATGTGAGTTACCTCACT
CATTAGGCACCCAGGCTTTACACTTTATGCTTCCGGCTCCTATGTTGTGTGGAATTGTG
AGCGGATAACAATTTACACAGGAAACAGCTATGACCATGATTACGCCAAGCTCGGAATT
AACCTCACTAAAGGGAACAAAAGCTGGGTACCGGGCCCCCCTCGAGATCCGGGATCGA
AGAAATGATGGTAAATGAAATAGGAAATCAAGGAGCATGAAGGCAAAAGACAAATATAAG
GGTCGAACGAAAAATAAAGTGAAAAGTGTTGATATGATGTATTTGGCTTTGCGGCGCCGA
AAAAACGAGTTTACGCAATTGCACAATCATGCTGACTCTGTGGCGGACCCGCGCTCTTGC
CGGCCCCGGCGATAACGCTGGGCGTGAGGCTGTGCCCGGCGGAGTTTTTTGCGCCTGCATT
TTCCAAGGTTTACCCTGCGCTAAGGGGCGAGATTGGAGAAGCAATAAGAATGCCGGTTGG
GGTTGCGATGATGACGACCACGACAACTGGTGTCAATTTAAGTTGCCGAAGAAGACCTG
AGTGCAATTTGCAACATGAGTATACTAGAAGAATGAGCCAAGACTTGCGAGACGCGAGTTT
GCCGGTGGTGCGAACAATAGAGCGACCATGACCTTGAAGGTGAGACGCGCATAACCGCTA-

FIGURE 99B

